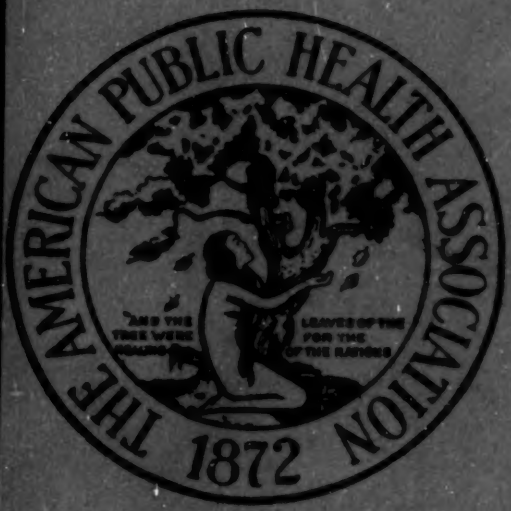
American Journal of

PUBLIC HEALTH

and The Nation's Health



The 82nd Annual Meeting
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volume 44

number 6

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1. Doyle, P. J., and Livingston, S.: J. Pediat. 43:413 (Oct.) 1953.
2. Whitty, C. W. M.: Brit. M. J. 2:540 (Sept. 5) 1953.

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American Journal of

PUBLIC HEALTH

Official Monthly Publication of the American Public Health Association, Inc.

Volume 44 | June, 1954 | Number 6

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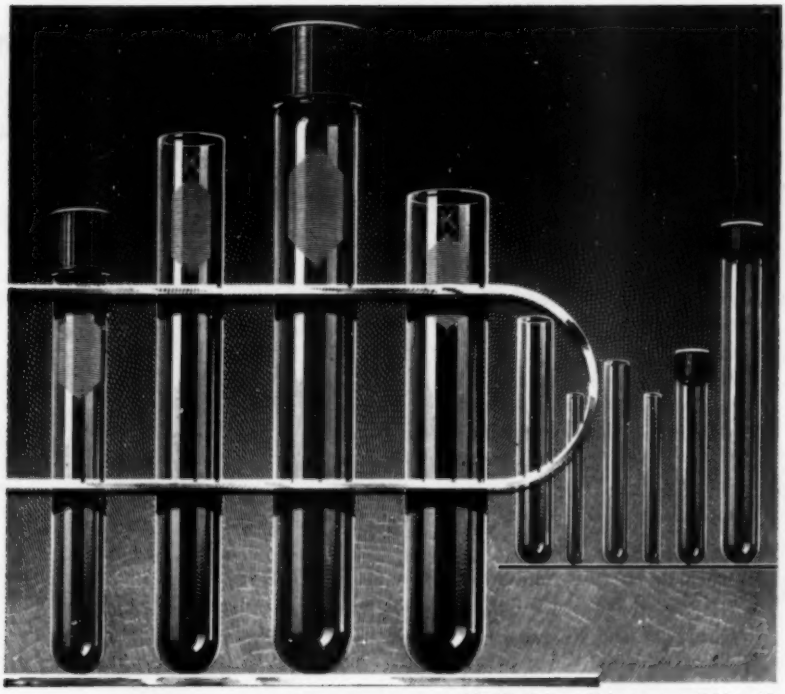

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Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association, Inc., unless formally adopted by the vote of the Association.

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1. McClellan, W. S., The Importance of Carbon Dioxide in the Human Body (unpublished paper)

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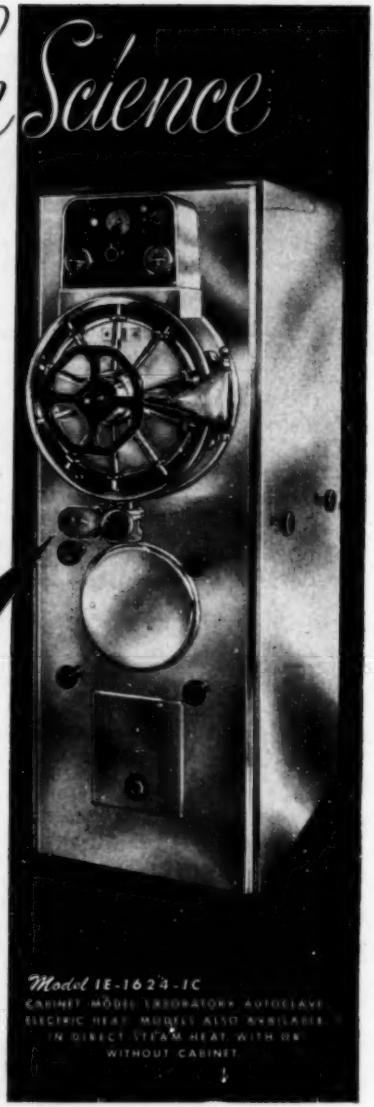

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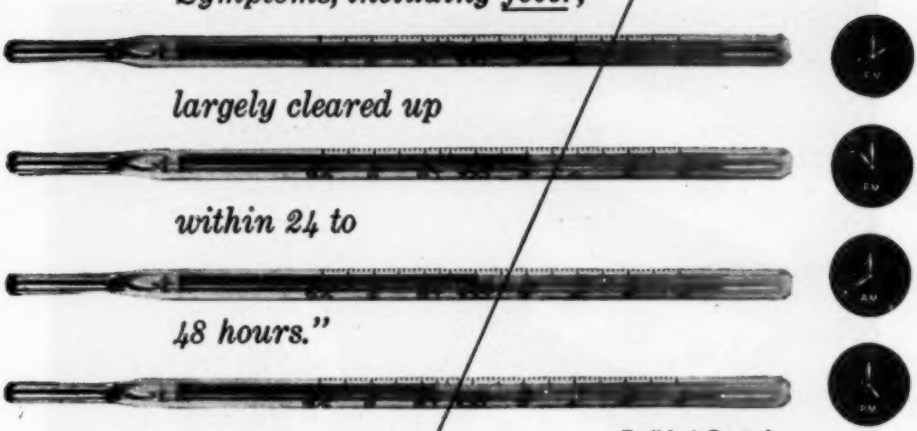

largely cleared up within 24 to 48 hours."

English, A. R., et al.:
Antibiotics Annual (1953-1954).
New York, Medical
Encyclopedia, Inc., 1953, p. 70.

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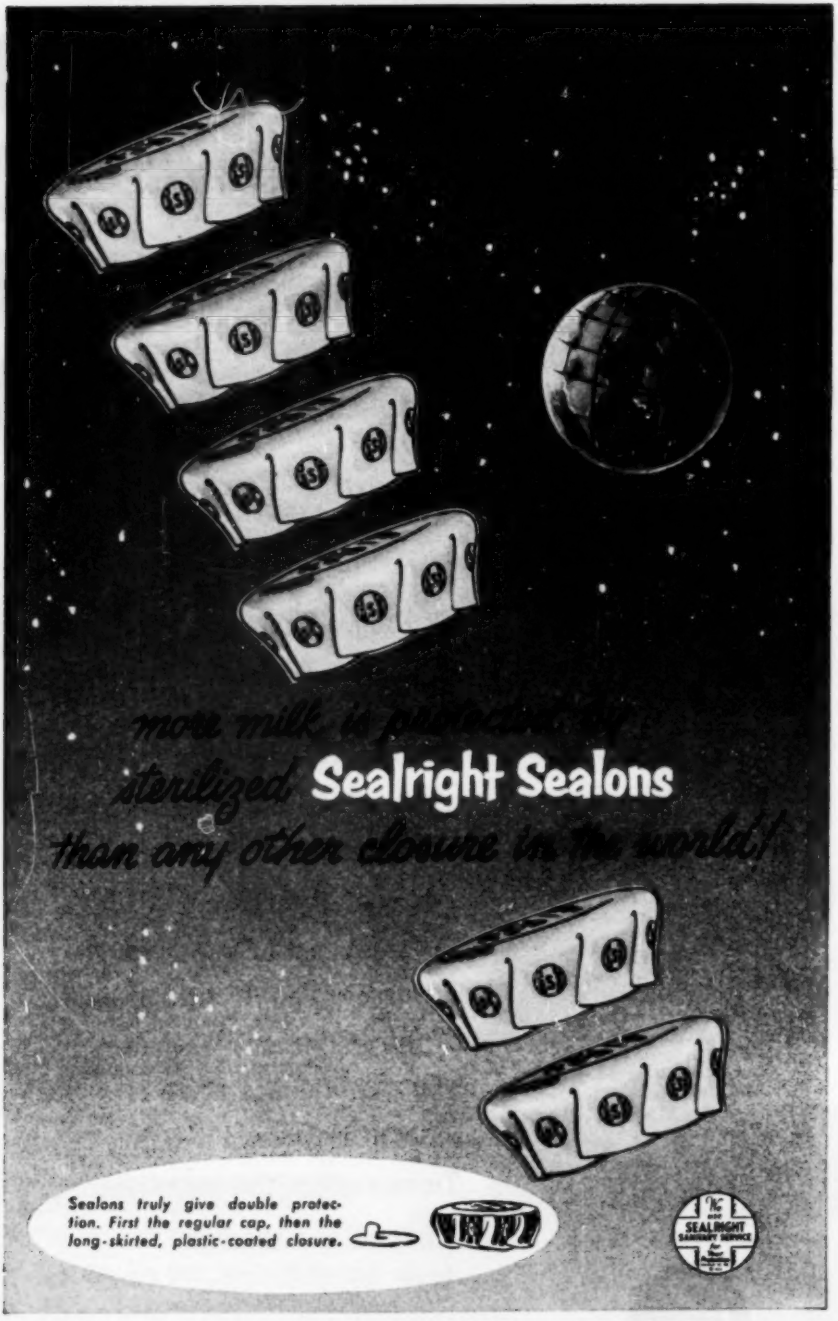
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(1) Hopkins, J. G.: AMA Arch. Dermat. & Syph., 67:479-483 (1953).
(2) Sullivan, M., and Bereston, E. S.: J. Invest. Dermat., 19:175-178 (1952).

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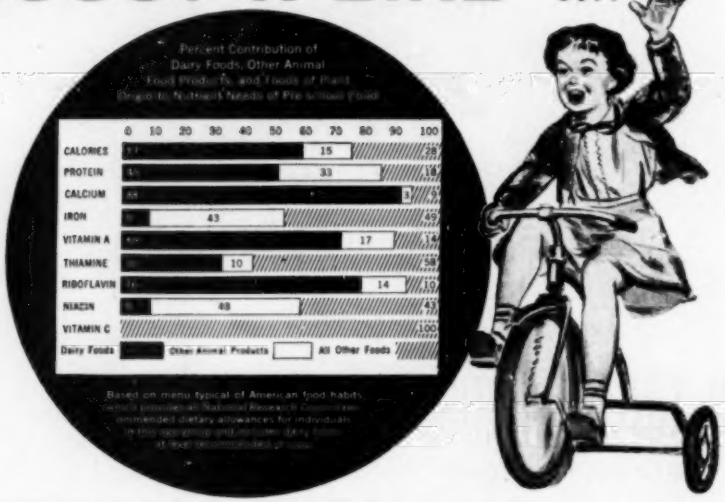

Learning to ride a bike or pushing a doll buggy around the block are part of the pre-schoolers big job of growing up — so is learning to eat a variety of foods, to meet the nutrient needs of growth and to establish good eating habits for a healthy life.

Protein is essential for the child's developing muscle, and for growth of bone as well. Milk and milk products are the primary source of protein in the diet of young children.[1] Eggs, meat, fish and poultry are also sources of high quality protein and should be included in the child's diet.

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[1] Jeans, P. C. Feeding of healthy infants and children. J. Am. Med. Assn. *142*:807 (March) 1950.
[2] *The National Food Situation*. NFS—60 U. S. Department of Agriculture, Washington, D.C. (April-June) 1952.

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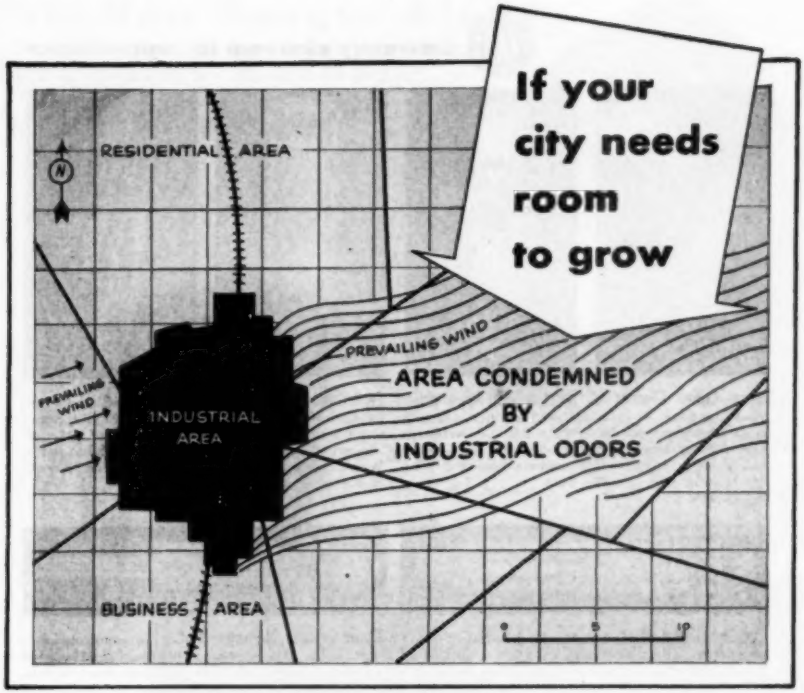

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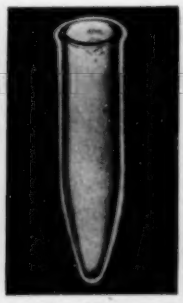

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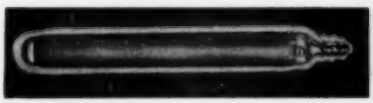

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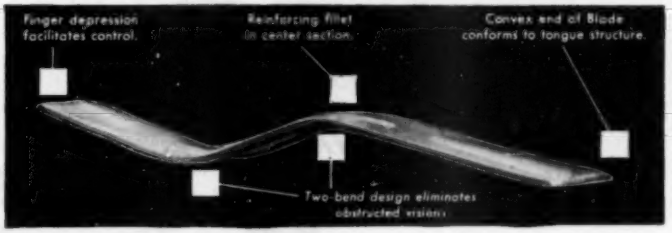
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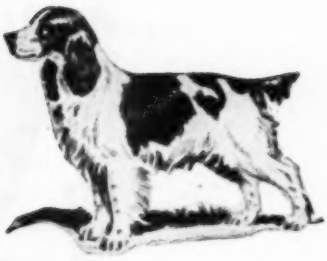

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(1) Vet. Med. 48:425 (Oct.) 1953.

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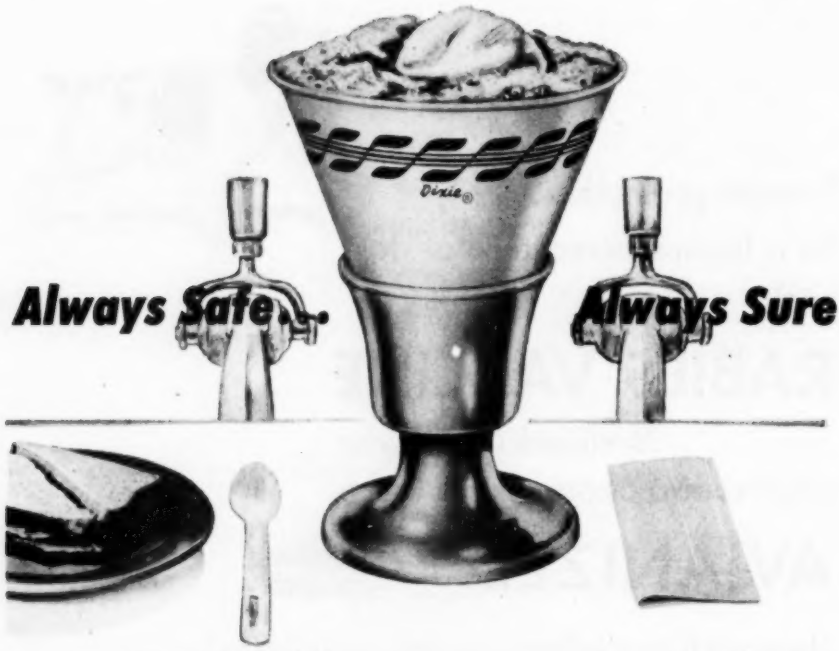

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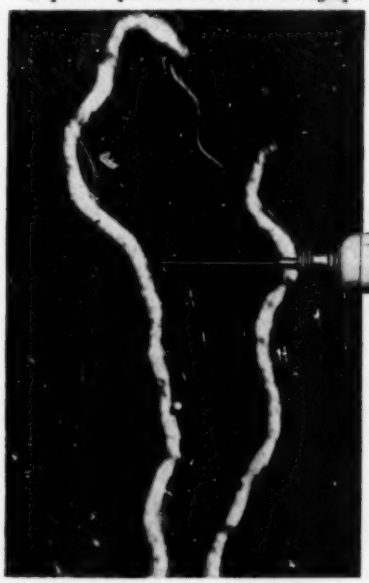

1. Smith, C. A., and others: Am. J. Syph., Gonor. & Ven. Dis. *38*:136 (March) 1954
2. Moore, J. E.: Ann. Int. Med. *39*:644 (Sept.) 1953

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1. Bolliger, A., and Pascoe, J. V.: Australian Journal of Science *15*:215 (June) 1953.
2. Gunther, M.: Brit. J. Nutrition *6* (No. 2): 215, 1952.

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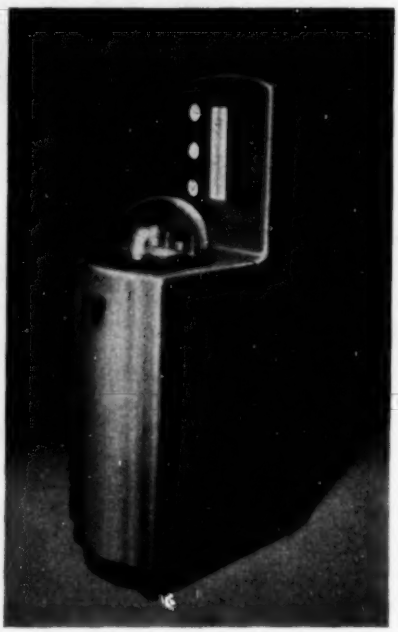

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On the Use of Sampling in the Field of Public Health

Here are methods with meaning to every public health worker who deals with figures—and who does not?

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Prepared by the Committee on Sampling Techniques in Public Health Statistics, Statistics Section, American Public Health Association, for the use of program administrators.

INTRODUCTION

✣ Sampling, in its broadest sense, is a procedure in which one or more members of a population of people or things are picked from the population. The objective of selecting this subgroup, or sample, is to make certain observations upon the members of the sample, and then, on the basis of these results, to draw conclusions about the characteristics of the entire population. When sampling is used instead of examining every member of the population it is usually for the purpose of saving money or time.

The conclusions which we draw from a sample are necessarily subject to one special kind of error, generally called sampling error, because the data have been collected for only a part of the population. However, with modern technics, a sample may be planned so that the probability is small that this error will exceed certain specified limits. When we employ sampling of this type we can say in advance how

much sampling error we are willing to tolerate and then select the sample so that our statistical conclusions about the characteristics of the whole population will not have a sampling error greater than the tolerable limits, except very rarely. This type of sampling is known as probability sampling, and it is to the subject of probability sampling in public health work that this report is addressed.

The use of probability sampling in the field of public health has apparently been hampered by two widespread and somewhat contradictory attitudes toward it. The first is that sampling will not give sufficiently accurate results for a particular job at hand. The second is that probability sampling is too difficult or expensive when compared to the study of a convenient "chunk" of the population, such as a convenient batch of records, a convenient community, or a group of patients to whom the investigator has ready access.

When sampling is about to be rejected because of the belief that it will not give sufficiently accurate results, a re-examination of the errors inherent in a complete coverage may reveal that the additional error due to sampling is an insignificant part of the total error. The belief that sampling will not be accurate enough also may arise because the investigator has not stopped to work out the major objective of his investigation or to consider how the results will be used. Whether or not sampling is used in such cases, a consideration of whether it could be used brings about a clearer understanding of the purposes of the investigation and, thus, has a beneficial effect upon the conduct of the work.

The second attitude mentioned above is that probability sampling is too expensive compared to what is sometimes called "chunk" sampling. The administrator may find us quite persuasive when we say that it is often unnecessary to spend the money required for complete coverage. It is more difficult to be persuasive, however, when we say that it is sometimes necessary to adopt the more expensive of sampling alternatives. Saving money is a worthy objective. It is, in fact, one of the guiding objectives of the probability sampling we wish to describe in this report. Hence, to give this question its proper share of attention we shall put off to a later section a discussion of the relative merits of probability sampling and "chunk" sampling.

Aside from these two negative attitudes about probability sampling, undoubtedly the most serious obstacle to the greater use of this technic in public health is ignorance of the methods involved.

The Committee on Sampling Techniques in Public Health Statistics of the Statistics Section, American Public Health Association, is of the opinion that sampling can profitably be employed for many public health jobs and that beliefs of the sort mentioned previously and ignorance of sampling methods have hindered the greater use of what can be a very valuable tool. The committee has prepared this report in order to describe in nontechnical language the nature of sampling, to give a little idea of what is involved in the practice of sampling, to give a few examples of the use of sampling in public health work, and to list some references for further reading.

In writing this report we have leaned upon three sources in particular. One is "A Brief Statement on the Uses of Sampling in Censuses of Population, Agriculture, Public Health and Commerce," prepared by W. Edwards Deming, a member of the Sub-commission on Statistical Sampling of the United Nations Economic and Social Council.[1] This statement was based upon a working paper of the sub-commission bearing the reference code E/CN.3/ Sub 1/W.1. In some places we have para-

phrased this document and in others we have quoted from it. We are indebted to Dr. Deming and to the sub-commission for permission to make this use of their publication. For the two other sources that have been used extensively see references 2 and 3.

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I. THE NATURE OF SAMPLING

What Sampling Is and Some of Its Advantages

The idea of achieving speed and economy or both by using a sample to represent the whole is so commonplace in everyday life that one is likely to overlook some of its applications. The housewife who snaps a few beans in the basket to see whether they are fresh or not is using sampling to decide whether the average quality of the beans is worth the price she is asked to pay. The great bulk of this everyday sampling is of an intuitive type and not much is lost in most cases if a wrong decision is made on the basis of the sample.

In administration and research, on the other hand, a lot may depend upon the decisions that are made. Hence, a more scientific type of sampling is called for—some method by which we may know what the limits of error are for the conclusions that we draw from the sample. We should like to be able to give some sort of guarantee about the size of the sampling error so that we can weigh the economy of sampling against the chances of error of a certain size and decide whether the savings can be realized without sacrificing too much in the way of precision. It is here that probability sampling makes its contribution.

But let us consider in more detail the returns that we may expect for introducing this additional error due to sampling. In the words of the Sub-commission on Statistical Sampling of the United Nations:

> The main advantages of sampling, in comparison with complete enumeration, are speed and low cost, with controlled and often enhanced reliability.
>
> Any survey, or any collection or tabulation of information from existing records that can be carried out completely can also be carried out by sampling. Under difficult conditions sampling is often possible when a complete count would be a failure.[1]

Certainly, the most frequent reason for deciding upon sampling is that the cost is lower than complete coverage of the population of persons or things. In fact, sometimes the cost of carrying out a test or an examination on every member of the population is prohibitively expensive. For example, a survey of the nutritional status of children in a community may involve elaborate and costly tests which can only be carried out by using small samples of the child population. In considering reduction in cost through the use of sampling, however, it is important to remember that the cost of a sample of 1/rth of the population will usually be greater than 1/rth of the cost of covering the population completely. There are certain overhead costs in sampling which are not encountered in complete coverage.

The fact that sampling cuts down the time necessary for making the information available is perhaps the next most frequent reason for using sampling. This is particularly important when the sample is being used to measure something that is changing rapidly. Again, there is some overhead in time associated with sampling, so that the information is not available in 1/rth the time from a 1/rth sample.

Sometimes in a study or survey rather elaborate information is required which is to be obtained by interview or questionnaire. In this case, a sample involves far less burden upon that part of the public from which the information has to be obtained, whether it be housewives, doctors, clinic patients, or others. The fewer who have to take time off to answer the questions, the better.

Still another advantage of sampling is that a small office can sometimes carry on the work without increasing its staff or making use of outside resources, while complete coverage might be out of the question. Even when outside resources are required for a special investigation, the problems of hiring part-time people and finding space in which they can work are much less acute when sampling is employed. In health surveys it is sometimes impossible to train a sufficient number of interviewers to conduct a detailed interview in a prescribed manner in every household of the population being surveyed. A sample offers the only feasible way of carrying out the survey. This is particularly likely to be the case if the definitions employed are necessarily difficult or if experienced judgment by the interviewer is involved, as occurs in measuring the degree of disrepair in housing surveys.

The use of sampling often permits a higher quality of work to be maintained. The intensive training of an interviewing or coding staff is more easily accomplished when the staff is small. Furthermore, higher standards of ability and personality can be maintained in selection of the staff. For example, the coding of diagnostic material during the processing of morbidity surveys is a complex operation. Small crews of coders can be more carefully selected, trained, and supervised and can, therefore, give more uniform and more accurate results.

The very nature of sampling directs attention to errors, not only those resulting from the sampling but the other types which would be present even in complete coverage. It always becomes important to get some clearer ideas of the magnitude and direction of these other errors in a sampling investigation, and the effort to do this may have a wholesome effect on the quality of the results and certainly will make for more careful interpretation of the data.

Finally, there are instances when sampling is the only reasonable possibility. Such is the case when a test is being made that destroys or makes useless the object being tested. For example, in the routine testing of bottled milk for the presence of bacteria, complete coverage is out of the question. Thus, in some instances, complete coverage of the population is not only impractical but logically absurd.

What Sampling Can Do

The following list will show how very broad are the possible applications of the sampling tool in the everyday work of public health. Sampling can be used:

To obtain health information about the persons living in a health department jurisdiction for the planning of a new program.

To test the efficacy of a proposed health department procedure before deciding whether to put it into full-scale use.

To evaluate periodically the results of a health department procedure, such as a health education program.

To survey the environment in a health department jurisdiction, as in sanitation surveys and surveys of housing.

To measure the utilization of health services or the availability of medical care in the jurisdiction.

To obtain information from a large file at less expense and more quickly than would be possible by complete analysis.

To prepare preliminary bulletins on vital statistics in advance of final processing of the records.

To evaluate the reliability or completeness of registration of births and deaths or other record systems.

Of course, there are many other uses. No division of the health department, no voluntary health agency, and no health research institute is without its own applications. It has been demonstrated many times that the application of sampling can bring about savings in routine office work as well as in special studies and surveys. Sometimes it is a matter of applying sampling where it had not been realized that it could produce sufficiently reliable results. At other times methods can be suggested for controlling quality at less expense. The use of sampling for quality control has found widespread favor in industry and the application has also been made in such large-scale, government statistical operations as the processing of records from the decennial census and those of the National Office of Vital Statistics.

Two continuing sample operations in the field of public health and medical records that may be mentioned are: (1) the sampling of sickness records for Army personnel; and (2) the 10 per cent sample of death records analyzed each month by the National Office of Vital Statistics.

Reliability of Sampling

How reliable is sampling? The answer is: Sampling can be just as reliable as we need to make it and can afford to make it. The decision that nothing short of complete coverage of the population will give a sufficiently reliable statistical picture is often made without real justification, probably because of failure to consider two important aspects of reliability. The first is that the error we can tolerate in statistics is related to the purpose the statistics are to serve. When that purpose is not clearly recognized in advance there is quite understandably a tendency to seek refuge in complete coverage. More attention to the matter of final use of the statistics will frequently show that a sample can give sufficient accuracy for all major uses and, when this discovery is made, the additional time spent in planning is more than paid for by the lower cost of the investigation itself.

The second aspect of reliability to which attention should be directed is closely related to the first. It is the realization that sampling error (which, it will be remembered, is the error resulting from taking a sample rather than the whole population) is only one of the possible sources of error in the results. Nonsampling error may be of many different types and the types vary according to the kind of investigation being made. In the case of one kind of investigation—the survey—the different sources of error have been catalogued in a very interesting and useful chapter of a book by Dr. Deming.[2] Dr. Deming lists 19 different sources of procedural bias and error. We cite some of these to give an idea of their nature. Most of them are sources of error with which everyone is familiar, but familiarity seems to have led to excessive tolerance in many cases. Here are 10 different sources of error that are found in surveys:

1. Failure to state the problem carefully and to decide just what statistical information is needed.
2. Failure to define the population about which we want information with sufficient precision.
3. Errors in response, voluntary and involuntary, i.e., errors in the answer to a question due to misunderstanding, misinformation, misrepresentation, faulty memory, etc.
4. Bias in response arising from the interviewer.
5. Imperfections in the design of the questionnaire and tabulations of the results.
6. Bias arising from nonresponse, i.e., bias from the fact that answers were not obtained for all in the sample and from the fact that these nonrespondents differ from the respondents in the characteristics being measured.
7. Bias arising from an unrepresentative date for the survey or of the period covered.
8. Random sampling errors. (See below.)

9. Sampling biases. (See below.)
10. Processing errors (coding, editing, calculating, tabulating, tallying, posting, and consolidating).

Of the 19 sources of error listed by Dr. Deming only two are found in sampling but not in complete coverage of the population. The author calls these two "random sampling errors" and "sampling biases." The first is the kind of error with which probability theory deals and the second arises either from human failure in carrying out the sampling instructions or from technical failure in the process of generalizing from the sample to the whole population.

Dr. Deming has this to say of sampling error:

> One often hears objections to sampling because of sampling errors. Such objections can be sustained only if, after consideration of the other inaccuracies, the elimination or reduction of the sampling errors seems to be a wise investment. Sampling errors have the favorable characteristics of being controllable through the size and design of the sample. . . . Sampling errors, even for small samples, are often the least of the errors present. (See reference 2, p. 47.)

In its general outline this consideration of sampling and nonsampling errors is not peculiar to surveys, but is common to any problem of measurement, whether it be the taking of blood pressures or the decennial census.

But what do we mean when we say that sampling errors are controllable? We obviously do not mean that we can tell how great the error is in a particular sample and in measuring a particular characteristic. What we do mean is that we can give a very useful kind of guarantee regarding the sampling error. Let us take as an example a hypothetical investigation of the children in the elementary school system of a city to determine the proportion of children with vision below a certain standard. Vision below this standard we shall call "impaired vision." We have selected completely at random a sample of 400 children from the elementary grades of the school system and have determined by means of tests that 4 per cent of the children in the sample have "impaired vision." In this particular investigation the guarantee might take the following approximate form: "The chances are 19 out of 20 that the 4 per cent of children with impaired vision, as estimated from the sample, does not differ by more than 1.9 per cent from the result that would have been obtained if the identical test had been given to every child in the elementary school system."

The range of approximately 1.9 per cent on either side of the estimated 4 per cent is known as the "confidence interval" of the estimate. The principles of sampling tell us that if we were to repeat this investigation over and over again, each time making an estimate from a new sample of 400 children in an identical manner, and were to compute confidence intervals as has been done here from the results of each sample, in 19 out of 20 instances the confidence interval would include the city-wide value, i.e., the value which would be obtained if the test had been performed upon every child in the elementary school system.

In the planning of a sample we wish to know the most economical type of sampling plan and to estimate the size of sample required to give the desired precision. For both of these purposes we must have some advance knowledge of the size of sampling error associated with samples of different sizes and designs. Sampling principles can provide us with this equally useful but less specific type of information in advance of the sampling, providing that we know roughly what the results will look like (as we frequently do by examining results obtained at other times or in other places).

The reason some foreknowledge of

the approximate results is needed is that the formulas for the sampling error associated with different sampling plans require information on two points: the mean value of the measure (or the proportion of the population having the characteristic being studied) and the amount of variability in the measure from member to member in the population, expressed in terms of the standard deviation. For example, if we were planning to survey a sample of houses in a city to estimate the average state-of-repair score of houses in the city, we would need to know roughly what the average score and the standard deviation of scores from house to house would look like. The better the information we have on these points, the more accurately we can estimate the sampling error of the survey results in advance, but even informed guesses will be helpful. (If the result desired from the survey is simply the proportion of the population having some characteristic, a knowledge of what that proportion is likely to be is sometimes enough.)

Note that these statements concerning limits of error provide no guarantee on the nonsampling error. Nothing is said, for example, about the error that may be implicit in the test itself. No test is perfect and the one given in the vision test illustration mentioned previously may be one which, if repeated upon the same child, would show a great deal of variability in results, either because of reading errors by the person making the test or because of some lack of precision in the measuring device. Such errors implicit in the test will be present in the results of an investigation even if it covers the entire school population. Nevertheless, the use of the principles of sampling both for planning the sample and for a statement of the limits of sampling error in the final result are the features of probability sampling that make it possible for us to use it with confidence.

The sampling error that we feel we can tolerate and the chances that we are willing to accept of being off by this amount can be altered to suit our convenience, but, in general, the smaller we demand the sampling error shall be, the more expensive the task of measurement becomes. This is because reducing the sampling error means increasing the size of the sample and this, of course, increases the cost. (Improvement can sometimes be made without increasing cost by devising a more efficient plan, but there is a point beyond which one cannot go in improving the sample design. The only way to reduce sampling error from this point on is to increase the size of the sample.)

The use of sampling principles in advance of the actual collection of data is valuable to the statistician and the program administrator alike. In the case of an expensive survey it might work something like this: The statistician first gathers whatever information is available from other sources as to how much the particular characteristic being measured or counted varies from one unit of the population to another. He also brings together whatever facts are available about the cost of the different operations involved in collecting the data. If there is no information on hand regarding these matters, he may advocate the conducting of a small pilot study to collect it in advance of the full-scale project. Such a pilot study would also provide an opportunity to test the measuring device itself, that is, the interview, the clinical test, the examination procedure, or whatever else was to be employed for the purpose of measurement or description. With the information on variability and costs and a knowledge of sampling technics, the statistician can determine which of many possible plans will probably give the least sampling error for a fixed sum of money; or, for a required precision, which plan will cost the least.

In our hypothetical survey of impaired vision, for example, the results of other studies of impaired vision among school children might permit the statistician to devise a probability sampling plan that, without sacrificing any of the sampling precision, would cost considerably less than a selection of 400 children completely at random. The statistician turns over to the administrator his estimates of cost and expected limits of sampling error. Thus, the administrator can tell fairly reliably before embarking upon the project whether the amount he is able to spend will yield results of useful precision, though in making his decision he must also consider the errors from sources other than sampling (see below).

This, then, is what we mean when we say that sampling errors are controllable through the size and design of the sample: By skillful use of existing resources and knowledge a plan of sampling can be devised such that the sampling error is reduced to the minimum for a given expenditure of money; and, furthermore, the limits of sampling error, or "confidence interval," of the estimate made from the sample can be stated alongside the estimate itself.

But what about the many types of nonsampling error, some of which we have cited from Dr. Deming's list? Can these be controlled too? Such errors can be controlled, but not in the same sense that sampling errors can be controlled. Some nonsampling error is always present and increasing the size of the sample will not reduce it. It can be reduced, however, by careful planning, including the making of trial runs. Even if the sampling consists of no more than the selection of every tenth card from a file, when any large amount of work is involved a trial run will pay off. It will show up unexpected difficulties before it is too late to make changes in the plans.

Research on the magnitude of the errors implicit in procedures of measurement, such as the errors mentioned earlier in connection with testing of vision of school children, should not be overlooked. If the investigator has no quantitative information on this point, he will do well to make the study of errors of measurement a part of his investigation. As one example of this type of research the reader is referred to the study of the errors in counting blood cells made some years ago at the Mayo Clinic. The opening sentence of the report on this study reads: "Our primary objective was to investigate the error of the blood cell count as it is made in good routine practice, and not as it might be made with special apparatus in exceptional situations." [6] Another example, unfortunately unpublished, is the study of the errors in blood pressure readings with a sphygmomanometer made some years ago at the Worcester State Hospital in Massachusetts, by means of a special stethoscope with multiple headpieces designed so that simultaneous readings of the same blood pressure could be made by several doctors.

There is not space here to cite the considerable experience that has been accumulated on the matter of reducing nonsampling errors.* However, it must be emphasized that it is this part of the planning of a survey, or other investigation, that frequently requires the greatest care and attention. This fact has a bearing on the answer to the perennial question: "If we are to employ an expert to take charge of the collection of data for the survey, what sort of expert should we look for?" The person to look for is someone who has had enough experience with surveys to be able to keep the nonsampling errors at a minimum. If not an expert in the particular subject matter that is to be dealt with, he must be supported by a

* References 2, 4, and 5 will be helpful in this respect.

technician thoroughly familiar with the subject matter.

It has already been mentioned that the control of nonsampling errors is usually easier in sampling than when coverage is complete. This is because there are fewer workers to supervise and because more attention can be devoted to detail. If interviewers or other trained personnel are being used to collect the data, there are fewer to train, and greater uniformity and intensity of training is possible. For instance, 20 persons might have to be taught to count the number of decayed, missing, or filled teeth among the patients of a large institution. A 25 per cent sample would require the training of only five. It is conceivable, therefore, that an estimate for the whole institution based on a 25 per cent sample could give a result closer to the true value than one obtained from an examination of every patient.

We have said that the program administrator must consider both sampling and nonsampling errors in considering how much sampling precision to buy. To illustrate, let us say that he believes he cannot tolerate a relative error due to sampling of more than 2 per cent. It may become apparent on further study, however, that because of some intrinsic error in the method of measurement (such as, for example, a lack of precision in the test of vision in the example cited previously) there is a possible error of as much as 10 per cent in the result even if every member of the population is included in the investigation. In that case the administrator has the choice of dropping the idea of making the study, of revising upward his ideas of tolerable sampling error, or of spending money to attempt to reduce the nonsampling error by some means. This last could be done by devising a more precise test or, in other types of studies, by adopting more objective definitions or clearer instructions, or by intensifying the program of interviewer training, etc. A good deal of attention has been given here to this matter of the reliability of sampling because it is the cause of so much misunderstanding. Furthermore, the heart of probability sampling is the controllability of sampling error.

Disadvantages of Sampling and Situations in Which Sampling Will Not Help

It is important to bear in mind that sampling is not an end in itself. It should not be thought of as a procedure that adds elegance to any job that comes along. Its use is suited to certain situations and unsuited to others, and it has its disadvantages. Before proceeding with a discussion of the practice of sampling it might be well to mention some of these disadvantages of sampling and situations in which it cannot help.

Where an Inventory Is Needed—Obviously, sampling cannot help where a record is needed for every member of the population of persons or things. A hospital could never make medical history sheets for only a sample of its patients because actions affecting an individual patient must be based upon a report concerning that individual alone. The same would be true of a case register. However, if a hospital wishes to draw some general conclusions about a certain class of its patients, a sampling of the medical records for that class of patients may give the desired results at great savings of money and effort.

Data Required for Many Subdivisions of the Population—There are also occasions when data must be tabulated in great detail in order to be valuable. Sampling would make the frequencies in some cells of the tables so small as to be useless for purposes of analysis. In the decennial test of completeness of birth registration, for example, census

enumerators fill out a card for any infant less than three months of age living in the household at the time of the census. The birth registration records are searched for the names on these cards and an index of completeness of registration is computed. A good deal of money would be saved if this could be done on a sample basis. However, incompleteness of registration has become a highly localized problem. Action to improve the registration depends upon knowing the particular county in which it is poor. Hence, a determination of the size of sample required led to the conclusion that all infants less than three months old would have to be included.

Additional Error Introduced—In sampling, as we have said, an additional source of error is introduced. While the limits of sampling error can be calculated approximately in advance and it can in this sense be controlled, there still may be occasions when nothing less than a complete coverage of the population will be sufficient. Such occasions are not as common as one might think. One instance that can be cited is the reporting of cases of an epidemic disease. Health department action may be based on the reporting of a very few cases, and outbreaks of many cases may be missed in a sample because of their concentration in space and time.

Time and Skill Required in Planning—Since the planning of a good sample may require more time or technical skills than are readily available, this lack may sometimes argue against sampling. However, as has been pointed out, the planning time may be well spent because it gives a greater opportunity for the objectives to be clearly thought out and for misunderstandings to come to light.

Discrimination Against Those Not in the Sample—A peculiar situation may arise when a new treatment is being tried on a sampling basis or when sampled individuals are given some special and desirable service, such as a free physical examination, an x-ray, or free treatment if a case of illness is discovered. This has been handled in at least one study by providing the same service to all who heard about the offer and asked for the service during the course of the sampling. This might well be impractical in some projects, but in these projects it stands to reason that complete coverage would also be impractical.

II. SOME REMARKS ON THE PRACTICE OF SAMPLING

When to Call for Expert Assistance

We have said that there are jobs of sampling that can be carried out in a health department or other public health agency without the help of a sampling expert. We have also suggested that there are times when it will be wise and economical to call for outside help. Assuming it has been found desirable to sample, how does one decide whether to seek expert assistance or not? There is no hard and fast answer to this question. A lot will depend upon the amount of experience with sampling that is to be found in the staff of the office. However, the following matters should be looked into before making the decision:

The Cost of the Investigation—Is the study one in which a considerable sum of money is to be spent? If so, it is undoubtedly necessary to adopt a plan that will give the utmost in information for every dollar spent. The cost of obtaining the advice of a sampling statistician will probably be a small portion of the total and in many cases there will be a net saving.

The Complexity of the Task of Drawing a Satisfactory Sample—To attempt to grade sampling studies according to the complexity of the sample design re-

quired would take us further into the theoretical aspects of this subject than we intended to go in this report. There are, however, some clues to the probable complexity of the problem of sample selection that are supplied by a knowledge of the population being investigated and the resources at hand.

Sampling implies the physical selection of certain members of the total population. There must, therefore, be some catalogue or inventory of the population from which to draw the sample. If no such inventory exists, it must be constructed. For example, there is the common type of epidemiological study in which a sample of cases of a particular disease is compared with a set of matched controls to determine whether the cases differ from the controls in respect to some characteristic suspected of being related to the risk of contracting the disease. In these studies it is often necessary to create a register, or list, of cases of the disease in a specific population. Making up the register may require searching the records of doctors' offices, clinics, and hospitals of an area for all cases of the particular type being investigated. A list of persons to be used as controls may also have to be constructed. When these lists have been prepared a sample of persons with the disease can be selected and matched with persons in the list of controls.

The first question one might ask, therefore, in sizing up the problem of selecting a sample is: Can the population of persons or things that is to be sampled be represented by a file or list, each item of which represents a single member of the population? If so, is this file or list complete? Does every member of the population that is under study appear in the file or list once and only once? If the answer to these questions is "Yes," the sampling can usually be accomplished very simply. Very little additional difficulty is encountered if the file or list contains some items that are not members of the population we wish to study, but if there are duplicates or if some members of the population are not represented at all, the difficulties become greater. (These conditions do not necessarily preclude sampling, but expert assistance should probably be sought.)

Sometimes there is in existence a list or file that includes the entire population but the individual cards, folders, or list items are not the units we intended to sample. For example, we might set out to select a sample of families but find that the file contains a card for every adult person rather than a single card for each family. Or we might need a sample of individuals and have only a file containing a card for each family with the names of the members listed on it. In these cases in which the unit member of the list or file is not the same as the unit member of the population we wish to study there is some additional complexity.

If no list or file exists in which every member of the population is represented, we must consider whether one can be constructed, or whether the members fall in some natural order, as in the case of assembly line operations, so that a simple consecutive numbering system can be assigned to them. The problems of selecting a good sample are less difficult when the items to be sampled can be easily numbered. Two familiar examples of sampling where the units cannot be simply arranged in order and numbered are the making of differential blood counts and water sampling. The problems of devising acceptable probability samples in these cases are exceptionally difficult. The sampling of insect populations is another example of the same type.

The selection of a representative sample of the people living in a city or county or other health department jurisdiction is a common problem in public

health work. Finding an up-to-date and complete directory of the families residing in a community is a rare occurrence in this country. Nevertheless, experience indicates that directories, unless hopelessly out of date, can be helpful in reducing the cost of sampling, but this comes under the heading of problems for which expert assistance is desirable.

Very often there is no directory at all from which to sample. Usually the method employed in such cases is that known as area sampling. The inventory is constructed from a map by dividing it into small units of area. A sample of these small areas is then drawn. This is, therefore, an instance of the type mentioned earlier in which the unit actually sampled is not the same as the unit member of the population we wish to study. Area sampling problems have a great range of difficulty, depending upon the resources available and the efficiency demanded of the sample design, that is, the extent to which the design will provide the minimum sampling error per dollar expended.

The Complexity of Nonsampling Aspects of the Study—It has already been pointed out that the reduction of nonsampling errors is the part of the survey or other investigation to which the greatest care and attention may have to be given. We must ask questions about the sort of errors that would be encountered even if the study were designed to cover every member of the population. Has it been possible to state clearly the problem to be investigated? Has it been possible to define the population precisely? Is it going to be possible to reach all the members of the population without difficulty? Will people agree to answer these questions or to take this test? Are the questions of a factual and noncontroversial nature? Is the test to be given one that will yield consistent results when repeated by the same technician? When repeated by different technicians? If the answer to any of these questions is "No," it may be time to call in an expert. No miracles should be expected, of course, but sometimes a wider experience in dealing with similar obstacles will suggest ways of surmounting them.

For one class of investigation, the mail questionnaire, a special warning should be given. It seems to be very easy for those who have not had experience with this sort of inquiry to overestimate the amount of response to be expected and to underestimate the amount of bias that may be introduced by neglecting the people who do not return the questionnaires. In questionnaires addressed to a general population group the response rate seldom exceeds 50 per cent. When the respondents are members of a special group, such as doctors, nurses, directors of nursing homes, and so forth, the rate of response may vary greatly. It is probably widely recognized that the response depends upon the auspices of the study, the length of the questionnaire, the format of the questionnaire, and other factors. However, it is not so well known that the characteristics of those who do not respond may differ widely from those who do. Consequently, reliance upon statistical results of the tabulation of questionnaires from those who took the trouble to reply may lead to false conclusions. The respondents cannot in general be assumed to be a representative sample of those to whom questionnaires were mailed. How to overcome this bias and at the same time make use of the undoubted economies that can often be achieved by a mail questionnaire is a matter on which an experienced statistician's advice should be sought.

It will be noted that these comments also apply to any study or survey where the subjects are volunteers. It is generally conceded, for example, that a chest x-ray screening in which two-

thirds of the adult population of a community voluntarily submit to an x-ray cannot tell us very much about the proportion of significant films that would be found if the entire adult population had been screened. The proportion of positive films in the remaining one-third may be quite different.

Further Remarks on Calling in an Expert

The objection that is sometimes heard to the employment of a sampling statistician is that he will be unfamiliar with the practical aspects of a job, will confuse the issue with mathematical abstractions, and will recommend something more elaborate and expensive than anyone had in mind. With a proper understanding of the statistician's function on the part of both the administrator and the statistician such difficulties should not arise. For sampling is not an esoteric science. Its objectives are exceedingly practical. A statistician who understands good sampling is aware that no sampling plan is of value to an administrator unless it can be carried out in the field.

Furthermore, since modern sampling theory dealing with surveys and experiment design is much concerned with dollars and cents, it is incumbent upon the statistician to demonstrate that his plan will provide the accuracy required at a cost (including overhead) that is lower than any other practical plan meeting the same criteria for accuracy. Again, it must be emphasized that the sampling statistician can do a better job in this respect if he is brought in before plans have crystallized.

Brief Description of the Procedures in Sampling

It has been pointed out that when the type of sampling known as probability sampling is used we can say in advance how much sampling error we are willing to tolerate and can then select the sample so that statistical conclusions about the characteristics of the entire population will not, except rarely, have a sampling error greater than the tolerable limits. We shall now describe briefly what is involved in selecting a sample of this sort and how the confidence interval is obtained in a simple example.

The term "probability sampling" is applied only to samples selected in such a way that every member of the population has a known probability of being chosen and such that the probability is not zero for any member of the population. This is because it is only for samples selected with known probabilities that we can give the sort of guarantee mentioned in the section on Reliability of Sampling. When the probabilities are known and are not zero, sampling theory provides formulas that give the standard error of the measure being estimated from the sample, that is, the standard error of estimate.

This can be illustrated using the simplest type of probability sampling known as simple random sampling. In this type the probability that a particular member of the population will be selected is equal for all members. Thus, if we had a file consisting of cards numbered from 1 to 900 and wished to choose a simple random sample of 100 cards, we might pick 100 different numbers between 1 and 900, inclusive, completely at random. The cards bearing the selected numbers would constitute the sample. If the selection is truly random, no number has any greater or less chance of coming into the sample than any other number.

But how would one go about picking the hundred different numbers completely at random? One way of doing this would be to put 900 numbered slips of paper into a box, mix them thoroughly, and then withdraw 100 of

them, recording the numbers of all that are selected. A simpler and more foolproof method, however, is to make use of tables of random numbers. Opening to any page of such tables 100 three-digit numbers between 001 and 900 are picked out in some systematic manner, such as the first 100 in the odd-numbered columns. In case a number turns up a second time in the drawing it is discarded and the next number is taken in its place. This, of course, is necessary because we want to have 100 different numbers in the sample. It is called sampling without replacement. (In sampling with replacement each time a numbered slip was drawn from the box its number would be recorded; then the slip would be returned to the box and the slips would again be mixed before another slip was drawn. In sampling with replacement it is obvious that a given number can appear more than once in the sample; hence, sampling with replacement is much less frequently used in practical sampling work.)

Now let us suppose that the 900 cards in the file from which we are sampling have on them some measure, such as the age at death of a certain type of cancer case. The sample is to be used to obtain a quick estimate of the average age at death. The formula for the standard error of estimate of the mean in simple random sampling without replacement is:

$$\sigma_m = \frac{\sigma}{\sqrt{n}} \sqrt{1 - \frac{n}{N}}$$

in which n and N are the sizes of the sample and the population respectively, and σ is the standard deviation of the ages at death of these cancer cases.

The statistic, σ_m, is a measure of the scatter that sampling theory tells us we can expect in the means of samples. Hence, it is a measure of the error that can be expected owing to having taken a sample rather than the entire population. It grows smaller as n grows larger, and it is easily seen that if n is equal to N (which occurs when the sample includes every member of the population), σ_m becomes equal to zero; that is, we have no error due to sampling.

The nature of the statistic σ_m is such that if we find the average age at death of the cancer cases in the sample, which may be called m, we can obtain the confidence interval for this estimate by adding and subtracting from m a certain multiple of σ_m.* The multiple used depends upon the chance that we are willing to take of being off by a given amount. For example, it will be remembered that the statement of the guarantee in the example, cited earlier, of a sample survey of school children with impaired vision, started off as follows: "The chances are 19 out of 20 that the 4 per cent . . . as estimated from the sample, does not differ by more than 1.9 per cent . . ."

Another way of stating the same guarantee would be to say: "The range, 4 per cent minus 1.9 per cent to 4 per cent plus 1.9 per cent (i.e., the range 2.1–5.9), is the range which in 19 samples out of 20 will include the value that would have been obtained if the identical test had been given to every child in the elementary school system."

When the chance we are willing to accept of being off by more than the stated amount (1.9 per cent in that example) is one in 20, we speak of the confidence interval as a 95 per cent confidence interval. For this confidence interval the multiple used with σ_m is 1.96. For a 99 per cent confidence interval the multiple used with σ_m is

* Sometimes obtaining the confidence interval is not this simple. For example, the confidence interval may not be symmetrical about the observed value of the mean. However, this is not a textbook and for more rigorous statements of theory the reader is referred to the textbooks listed at the end of the report.

samples out of 100 will include the value that would be obtained if coverage had been complete, the multiple used is 2.58. The multiples to be used with other confidence intervals can be found in statistical tables.

Returning now to the example of the card file of cancer cases, we can say that the chances are 19 out of 20 that the mean age at death as estimated from the sample does not differ by more than $(1.96 \times \sigma_m)$ from the mean age we would have obtained had we used every card in the file.

In the formula for σ_m given above, σ refers to the standard deviation of the ages at death of all the cancer cases in the file. This we usually would not know, but it, too, can be estimated from the sample. So let us suppose that we estimated the mean age at death from the sample of 100 cards as 47.8 years and that we estimated the standard deviation of ages at death as 7.5 years. Putting $\sigma = 7.5$, $n = 100$, and $N = 900$ into the formula, we come out with

$$\sigma_m = .707$$

$$1.96\ \sigma_m = 1.38572 \text{ or about } 1.4.$$

Thus, from the sample of 100 cards we estimated the average age at death as 47.8 years and we feel pretty sure that, had we computed the average from all 900 cards, we would not have differed from the sample estimate by more than 1.4 years.

In this example we have started with the assumption that a sample of 100 cards was to be taken, but ordinarily we might want to use sampling theory in advance of the sampling to tell us how much error to expect from a sample of a given size or, more frequently, to tell us how big a sample would be needed to achieve a certain degree of sampling precision. For this, the same formula can be used by turning it around so that it gives n in terms of σ_m, σ, and N. A convenient way of writing the formula for finding the required size of sample turns out to be:

$$n = \frac{t^2 \sigma^2}{e^2 + \frac{t^2 \sigma^2}{N}}$$

in which e is the amount of sampling error we are willing to accept and t is the multiple of σ_m (1.96, or 2.58 or some other value from the tables) corresponding to the 95 per cent confidence interval, the 99 per cent confidence interval, or some other confidence interval. Supposing, for example, that we needed to know the average age at death of cases in the file to within one year of age, using a 95 per cent confidence interval. Then $e^2 = (1)^2$ and $t^2 = (1.96)^2$. Putting these into the formula with $\sigma^2 = (7.5)^2$ and $N = 900$, the result is found to be: $n = 174.25$ or about 174.

(Note that the sample would have to be larger than 100 because we are demanding greater precision.)

However, it will be observed that in finding the required size of sample, we made use of σ, a quantity which was to have been estimated from the sample. Obviously, we cannot estimate it from the sample in advance of sampling. In fact, in order to estimate the size of sample required we must have in advance some knowledge of the variability of the measure in which we are interested. In this example the knowledge might come from another study of a similar type of cancer, from vital statistics reports, or, if worst came to worst, from an informed guess on the part of an expert in this subject matter. It is because of this need for some advance estimate, or guess, as to the variability of the measure, that we have described this type of information provided by sampling theory in advance of sampling as "equally useful but less specific."

The basic principles that have been reviewed here can be extended to more complicated types of sampling. By way of illustration we give only a very general description of two of these.

Stratified sampling, a common variation of simple random sampling introduced in order to obtain more sampling precision for less money, is sampling in which the population is first divided up into more or less homogeneous subgroups, or strata. If the number of members of the population in each of the strata is known, simple random sampling can be done independently in each of the strata and an estimate of the measure desired, such as the mean or the proportion having some particular characteristic, can be obtained for the entire population by making a weighted average of the estimates from the different strata.

For substantial gains in precision from the use of stratified random sampling, both of the following must hold true: (1) it must be possible to divide the population into strata such that the mean of the measure that we are investigating, or the proportion having the particular characteristic, differs widely from one stratum to another; and (2) the number of members of the population in each stratum must be accurately known. Furthermore, the gains will not be realized and, in fact, the precision may actually be lowered (in comparison with a simple random sample of the same size) if the sample is improperly allocated among the strata. The simplest device for allocating the sample in stratified random sampling is known as proportional stratified sampling. This means that the same fraction of the stratum population is taken into the sample in each stratum. Even better methods of allocating the sample may be found by taking into account differences in the amount of variability and in the cost of collecting the information from one stratum to another. These optimum methods, their limitations, and the situations in which they are likely to prove valuable are beyond the scope of this report.

Two other points should be made, however, before leaving this subject. First, stratification that may be good for measuring one characteristic may be poor for another. Hence, when a sample is designed to collect information on a number of points, the sampling statistician usually sticks to rather a simple and basic type of stratification. Second, stratification may be desirable for reasons other than that of obtaining a more precise estimate for the entire population. Sometimes there may be interest in having separate estimates for each stratum, or there may be a different problem of data collection in one or more strata.

Sampling of clusters or aggregates is of particular value in surveys of human populations to save money in reaching people where they live. In this type the members of the population that is sampled are not the units in which we are ultimately interested but are clusters or aggregates of those units. For example, in sampling the population of a city a sample of blocks may be selected and all the households in the sample blocks may then be included in the sample. It is apparent that such a sample involves less traveling than a simple random sample of households of the same size. However, a simple random sample of households has less sampling error for most items than a simple random sample of blocks containing the same number of households; and, in general, sampling of clusters or aggregates will almost always be found to sacrifice something in precision when compared with samples of smaller units, the sample size in terms of the smaller units being the same. Thus, supposing a city has 20 elementary schools. A sample of five schools containing 2,400 pupils in all can be expected to be less

precise for characteristics of the pupils than a random sample of 60 classrooms containing the same total number of pupils. The latter will, in turn, be less precise than a random selection of 2,400 pupils.

It is not necessary, though, to enumerate completely the entire cluster in sampling of this sort. The members of the clusters or aggregates selected in the sample can themselves be sampled. This is known as two-stage sampling. (In large-scale surveys the process is sometimes extended to three or four stages.) In a population survey of a city, for example, a simple random sample or a stratified random sample of blocks is chosen. A list of all separate households in the sampled blocks is then made and from this list a sample of households is obtained.

It may be seen that in a sample involving stratification and more than one stage, there is a great variety of ways that the total sample can be divided up. Such questions arise as: What proportion of the total sample should be taken from each stratum? How big a cluster should be taken as the unit for the first stage of sampling? Should we take more first-stage sampling units and fewer second-stage units within each first-stage unit, or fewer of the former and more of the latter? These decisions influence both the cost and the eventual sampling error of the results. It is in the selection of the combination that will give the most precision for a given sum of money, or the lowest cost for a required degree of sampling precision, that modern theory of sampling surveys affords a guide.

Three Illustrations of Sampling in Practice

In a previous section we have attempted to give some advice on deciding when to call upon expert assistance. Here we present three examples selected to illustrate sampling jobs for which expert assistance should not usually be needed. They are not to be taken as model procedures, but as representative of the many instances where a satisfactory sampling job can be done without resort to complicated sample designs.

1. Sampling from a File—The New York State Health Department had the problem of determining what proportion of the birth certificates arriving at the Office of Vital Statistics in Albany were on a new birth certificate form that had been introduced six months before. Supplies of the old form had not been withdrawn, so it was known that until these were exhausted the forms arriving would be a mixture of the new and the old. The certificates for births recorded in a particular month are numbered and are kept in numerical order.

In January, 1952, there were 12,910 births recorded. It was decided that 2 per cent of these, or 258 certificates, would provide a sample of sufficient size for the accuracy desired. A number between one and 50 was selected at random. This number was 27, let us say. Certificate numbers 27, 77, 127, 177, and so forth, were examined to determine whether they were on the new or old form. It was found that 80.6 per cent of the sample were new certificate forms. This percentage had a 95 per cent confidence interval of 75.6–85.6 per cent which was sufficiently accurate for the purposes at hand. The entire job required about an hour, while examination of all certificates would have taken at least a full day.[9]

2. Sampling from a File of Families—Sometimes files are kept by families, the information for all members of a family being recorded on a single card. In this event, the method in the previous section can be used if data about the whole family are wanted. If, however, a sample of say 400 individuals is desired, it may be advisable to have only

one person from a given family. In this event, the selection of the sample is not quite so simple. It is not satisfactory to select 400 cards (i.e., 400 families) and then pick one person at random from each family. This type of sample has an overrepresentation of the smaller families, because a person who belongs to a family of size one has 10 times as large a chance of being selected as a person who belongs to a family of size 10.

If a list of the number of persons per family is available, one method is to add these numbers in succession, making a cumulative list of numbers of persons. A sample of persons is then drawn from this list by the method outlined in the previous section. Thus, the sample might consist of individuals whose members are 35, 135, 235, and so on in the cumulative list. We must then locate these individuals on the family cards to obtain the necessary information about them.

This method is laborious if the population is large and is not feasible unless a list of the number of persons per family is already at hand. An alternative method is to construct this list from a sample of families. Suppose, for illustration, that the average number of persons per family is about four and that the population contains about 12,000 cards, i.e., about 48,000 individuals. A sample of one in 100 (about 480 individuals) is to be drawn. Inspection of some cards suggests that relatively few families have more than nine persons. Since 9/4 is 2.25, we first draw a sample consisting of 480 × 2.25, or 1,080 cards. (The reason for choosing this size of sample will be explained presently.) Since 12,000/1,080 is approximately 11, this sample can be drawn by taking every 11th card by the method given in the preceding section.

Now we form the cumulative list of numbers of persons in this sample. Since this sample will contain about 4 × 1,080 or 4,320 persons, we obtain the desired sample of 480 persons by taking every ninth person in the cumulative list. It is clear that no family with nine or fewer members will have more than one member in this sample. If families with more than nine persons are present, some of these will have more than one member in the final sample. This should happen only rarely; in order to avoid it completely, we would have to make the first sample of cards larger.

3. Sampling of Institutions—A common problem is to sample a group of institutions that vary in size. Although the best method of sampling varies from case to case, the general principles can be illustrated from recommendations made by the Commission on Chronic Illness for sampling the proprietary nursing homes in a state so as to obtain information about type of illness, care provided, length of stay, etc.[10] It is assumed that each institution must be visited in order to obtain the information, so that the purpose in sampling is to cut down the travel and time involved in these visits. There may, of course, be other reasons for preferring a complete census.

The steps in planning such a sample might be outlined as follows:

1. Be sure that the definition of a proprietary nursing home is clearly understood.

2. Obtain a list of all proprietary nursing homes that meet the definition. Some effort may be required to insure that this list is complete.

3. Usually there will be a number of large institutions that should automatically be included in the sample. Make a separate list of these institutions.

4. Group the remaining institutions into strata in order to make the sample more representative with respect to factors that are considered important. The best factors depend on the kind of data that are being sought. In the present example, rural-urban location, highest level of nursing staff, and bed capacity are suggested.

The remaining institutions are grouped into two or three classes representing rural-urban

location. Within each class, arrange the institutions in two or three subgroups (strata) according to the highest level of nursing staff. Finally, arrange the institutions within each subgroup in order of some measure of bed capacity.

5. Draw a sample from each subgroup (stratum) by the method outlined in the first section, taking, say, every third institution in any stratum, depending on the size of sample desired. Since institutions have been arranged in order of bed capacity within each stratum, the selection of every third institution will give a sample in which institutions of different sizes are represented in about the same proportion. The different strata are also represented in the same proportions, so that the sample has a good distribution on all three factors introduced into the stratification.

6. In this kind of study it is often advisable to obtain data about all patients in each institution that falls in the sample. If this is done, some care is necessary in combining data from the large institutions with those from the remaining institutions, because the large institutions were deliberately overrepresented in the sample (step 3). A convenient procedure for avoiding this complication, making the sample self-weighting, is to record data for every third patient in the large institutions.

"Chunk" Sampling vs. Probability Sampling

The word "chunk" is used by some statisticians to denote a sample the selection of which is dictated primarily by convenience or by administrative considerations and secondarily because, in the judgment of the investigators, it appears to be typical of the population about which information is needed. "Chunk" sampling is not probability sampling as we have described it in the Introduction. Sometimes it may have the appearance of probability sampling because after selecting a "chunk" the investigator goes to great effort to employ good probability sampling procedures within the "chunk."

To illustrate, let us suppose that a state health department wishes to determine the magnitude and nature of the problem of home accidental injuries in the state. A certain county is selected because it is believed by those who know the state well to be typical of the living conditions in the state—about average in urbanization, level of living, etc. An additional reason for its selection is that the county has an energetic county health department, quite well supplied with nurses who can be called upon to do some field work. Within the county a probability sample of areas is drawn, households are listed for the sample areas, and a subsample of households is chosen at random. By means of interviews with housewives in the sample households the desired information is secured and analyzed. Population rates are computed specific for age and sex and these are multiplied by the latest estimates of the state population for the corresponding groups. All goes well until the question arises: What sort of confidence interval can be used in connection with this state estimate? How far off might it be because we have interviewed in only 1,500 households instead of every household in the state?

At this point there is nothing to be said except that we do not know. Was it worth while to go to the trouble of probability sampling within the county? We can make statements about the sampling error of an estimate for the county, but the real interest lay in obtaining some knowledge of the situation in the state as a whole. A probability sample of 1,500 households drawn from the population of households in the state is very fine to talk about, but in this case, perhaps, confining the study to the county "chunk" meant the difference between a project costing $2,000 and one costing $20,000. (The tenfold difference is not unreasonable if we suppose that a great deal of help could be obtained in the county without extra cost to the state.) This type of situation arises very frequently in public health work of all kinds. What is the answer? Do we take a "chunk" and trust to our

imperfect knowledge of the variability between "chunks" of this sort to decide how much faith to put in the estimates? Or do we spend the money for a sample of the entire population in which we are interested so that sampling error of estimates will be "controllable"?

The kind of guidance that the statistician can give in attempting to answer this question is far from perfect. There are some deceptive answers that the statistician can warn against, though possibly the warning is not needed. First, it is unrealistic, having selected a convenient "chunk" for study, to look for the population of which this "chunk" can be considered a good sample. Second, it does not help much to decide that study of the "chunk" is to be considered purely preliminary—a pilot study, unless there is a reasonable chance that the pilot study will be followed up by a more conclusive study later. The statistician should be the last to minimize the importance of pilot studies. Nevertheless, there comes a time when we have to decide whether to proceed to a full-scale sampling (or complete coverage) investigation or drop the project for lack of funds. Finally, demonstration that the "chunk" is similar in many respects to the population about which we should like to generalize may increase our confidence in the estimate, but it still does not make it possible to attach a confidence interval to the estimate. There are instances on record when there appeared to be excellent agreement in a number of characteristics between a nonprobability sample and the population from which it was drawn; yet the confidence to which this agreement gave rise was later found to have been misplaced because the sample and population differed in one respect, namely, the characteristic the sample was designed to measure!

About the most that the statistician can say regarding the advantage of probability over "chunk" sampling is this: The use of probability sampling will often raise the cost of an investigation as compared with a study based on those parts of the population that can be reached most conveniently, or to which there is easy access because of the cooperativeness of some official, or which combine convenience with an appearance of representativeness. However, the additional money is being spent upon a very valuable commodity—a quantitative statement concerning the limits of error resulting from sampling. The marketability of the final product, the likelihood that the results will be trusted and used, are enhanced greatly by the addition of that statement. Sometimes the extra cost of doing a probability sampling job is trivial; sometimes it is completely out of reach. Whether the additional quality of the product is worth the additional cost must finally be decided by the purchaser. The statistician's job is to be a wise agent, presenting as accurately as possible the comparative costs and as much data as are available about the variability of the quantities to be measured.

CONCLUSION

It has not been possible in this report to do more than touch upon the principles of sampling, the determination of the sample size necessary to insure a specified degree of sampling accuracy, the variety of sampling designs that are possible, etc. For a thorough treatment of these subjects the reader is advised to consult the list of references. A short time ago an apology would have had to be made for the fact that discussion of the application of sampling to surveys and experiments could not be found in books. The health department statistician who wished to increase his knowledge of this branch of statistics in preparation for a particular job would have had some difficulty in bringing together the papers bearing on this sub-

ject. Much of the practical knowledge had never been put down in writing. Recently, however, some excellent books have appeared. The names of several of these (see references 2, 4, 7, and 8) and other papers and pamphlets that may be useful to the public health statistician have been included in the references.

REFERENCES

1. United Nations Sub-commission on Statistical Sampling. A Brief Statement on the Uses of Sampling in Censuses of Population, Agriculture, Public Health, and Commerce. (Prepared by W. Edwards Deming, member of the Sub-commission.) Lake Success, N. Y.: United Nations Publications Sales Number: 1948 XVII.1 (Feb.), 1948.
2. Deming, W. Edwards. Some Theory of Sampling. New York: Wiley, 1950.
3. Cochran, William G.; Cornfield, Jerome; Hansen, Morris H.; and Hurwitz, William N. Modern Methods in the Sampling of Human Populations. A.J.P.H. 41, 6:647-668 (June), 1951.
4. Hansen, Morris H.; Hurwitz, William N.; and Madow, William G. Sample Survey Methods and Theory. Vol. I. Methods and Applications. New York: Wiley, 1953.
5. Field Methods in Sample Interview Surveys. Report of a Conference Held at Ann Arbor, Michigan, March 22-24, 1951; Sponsored by the Survey Research Center, University of Michigan. September, 1951.
6. Berkson, Joseph; Magath, Thomas B.; and Hurn, Margaret. The Error of Estimate of the Blood Cell Count as Made with the Hemocytometer. Am. J. Physiol. 128, 2:309-323 (Jan.), 1940.
7. Cochran, W. G. Sampling Techniques. New York: Wiley, 1953.
8. Yates, Frank. Sampling Methods for Censuses and Surveys. New York: Hafner, 1949.
9. Patton, Robert E. The Sampling of Records. Pub. Health Rep. 67, 10:1013-1019 (Oct.), 1952.
10. Commission on Chronic Illness. Guide to Making a Survey of Persons in Establishments Which Provide Nursing and Personal Care. Processed. Oct., 1953. See special supplementary statement entitled "Sampling."

BIBLIOGRAPHY

History of Sampling

Stephan, Frederick F. History of the Uses of Modern Sampling Procedures. J. Am. Statist. A. 43, 241:12-39 (Mar.), 1948.

Two Pamphlets on Sampling

McCarthy, Philip J. Sampling. Elementary Principles. Bull. No. 15. New York State School of Industrial and Labor Relations. Ithaca, N. Y.: Cornell University (Apr.), 1951.

Hendricks, Walter A. Mathematics of Sampling. Special Tech. Bull. Virginia Agricultural Experiment Station, Blacksburg, Va. Feb., 1948.

Examples of the Use of Probability Sampling in Public Health

Hoyt, Cyril J.; Knutson, Andie L.; and Derryberry, Mayhew. What the People Know. Monthly Bull., Indiana State Board of Health, November and December, 1950.

Two random samples of the adult population of the city of Mishawaka, Ind., were interviewed, one before and the other subsequent to a tuberculosis x-ray survey in order to evaluate the effect of the survey and of an information campaign upon public information and attitudes toward tuberculosis.

Horvitz, Daniel G. Sampling and Field Procedures of the Pittsburgh Morbidity Survey. Pub. Health Rep. 67, 10:1003-1012 (Oct.), 1952.

An area probability sample of households located in a part of the Arsenal health district in Pittsburgh was used in conducting a survey which had as its objectives: (1) to provide general measures of the health status of the household population through the collection of data on recent illness, hospitalization, and accident experience; (2) to characterize the population under study through the collection of basic social and economic information; (3) to provide a general picture of the pattern of demand for health services; and (4) to furnish the nucleus of families to be followed for long-term studies.

Hemphill, F. M. A Sample Survey of Home Injuries. Pub. Health Rep. 67, 10:1026-1034 (Oct.), 1952.

The primary purposes of this study were to find the rate of accidental injuries occurring in the homes of Washtenaw County, Mich., and to study selected factors—environmental, physical, and psychological—associated with injuries and injured persons. Stratified area sampling was used.

Abdellah, Faye G., and Levine, Eugene. Work-Sampling Applied to the Study of Nursing Personnel. Nursing Res. (June), 1954.

Work sampling in industrial management dates back to the 1880's. This paper tells of the application of work sampling technics to estimating the distribution by type of activity of the working time of nurses in hospitals. The method has general applicability to time studies of other categories of personnel.

Report on Market-Milk Supplies of Certain Urban Communities. Pub. Health Rep. 53,

32:1381–1399 (Aug. 12), 1938. See particularly Appendix entitled "Sanitation Ratings of Milk Sheds," by Frank, L. C.; Fuchs, Abraham W.; and Dashiell, Walter N.

This describes a widely used schedule of sampling which has as its objective the rating of communities on the extent to which they have enforced sanitation requirements for pasteurized and raw milk. The sampling units are raw milk dairy farms, farms delivering milk to pasteurization plants, and pasteurization plants. A similar sampling plan has been used for sampling restaurants.

Hoffer, Charles R., et al. Health Needs and Health Care in Michigan. East Lansing, Mich.: Michigan State College, Agricultural Experiment Station, Section of Sociology and Anthropology. Special Bull. 365 (June), 1950.

This describes a stratified random sample containing a representative cross-section of all households in Michigan, exclusive of Wayne County, and a random subsample of all adults in these households. The purpose was to measure the extent of unmet need for medical attention, the opinions and attitudes people have regarding health facilities, the extent of participation in prepayment plans for medical and hospital care, and the people's awareness of local community health needs.

Taback, Matthew, and Williams, Huntington. Statistics in a Health Department Medical Care Plan. Pub. Health Rep. 68, 2:157–166 (Feb.), 1953.

Sampling is used in this program to reduce the cost of summarizing some of the medical records from the plan, for example, the clinic histories of adults presenting themselves for general examinations, and drug invoices. Results are used to improve administration of the plan.

Monthly Vital Statistics Report. Annual Summary for 1952. Part 2—Estimated Numbers of Deaths and Death Rates for Selected Causes: United States, 1952. (Based on the Returns of a 10-Percent Sample of Death Certificates Received in State Vital Statistics Offices in 1952.) Vol. 1, No. 13. Washington, D. C.: National Office of Vital Statistics, Public Health Service, Department of Health, Education and Welfare. July 21, 1953. See also Instructions to Special Agents for the Current Mortality Sample. National Office of Vital Statistics, January, 1952.

These publications describe a sampling project that is designed to provide preliminary national statistics on mortality by cause-of-death, age, and sex. The data are available monthly within about two months of the end of the month to which they apply.

Committee on the Hygiene of Housing, American Public Health Association. An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method. New York: American Public Health Association, 1945.

Although the purpose of this publication is mainly to describe the objective rating system and its application to the planning of housing programs, Chapter II does describe briefly the use of a stratified random sample of dwelling units in New Haven, Conn., by the New Haven Health Department and the City Plan Commission. When some action has to be taken on the basis of the condition of a single dwelling unit, the sampling method is, of course, not applicable. On the other hand, when results are to be used to plan or evaluate a housing program, the sampling method used here or one similar to it should achieve great economies.

Action Areas in Rehabilitation

Developing Rehabilitation Services

MORTON L. LEVIN, M.D., F.A.P.H.A.

Lack of comprehension—on the part of many of those who mold public opinion—of the possibilities inherent in, and the opportunities for, rehabilitation of the handicapped lies at the bottom of our inadequate efforts to meet this ever-deepening social problem.

✢ While everyone who has seen it work knows what rehabilitation is, a precise definition is difficult because of the necessary overlap between ordinary diagnosis and treatment and that required particularly for rehabilitation. Rehabilitation comprises all treatment and training of the sick and disabled that is designed primarily to increase or restore social or economic independence and usefulness and to diminish personal, social, or economic dependency. Obviously, all successful treatment of disease has this effect; rehabilitation, however, refers to treatment and training aimed specifically at this goal and beyond the ordinary treatment of disease per se.

There is widespread agreement (1) that more rehabilitation facilities are needed, and (2) that such facilities should be developed, wherever feasible, in hospitals, general and special. For example, the President's Commission on Health Needs stated, in its report, that "the average community hospital of 200 beds or more could profitably set aside perhaps 20 per cent of its beds for convalescent and rehabilitation care." *

In 1951 there were 1,441 hospitals, of all types, of over 200-bed capacity in this country. The number of trained specialists in physical medicine and rehabilitation in 1949 were 234. Of this number, 71—almost one-third of the total—were in a single state (New York). Twenty-three states in 1949 did not have a single trained specialist in physical medicine and rehabilitation.* Paradoxically, of the 90 approved training residencies available in physical medicine and rehabilitation, 50 per cent were unfilled at the time the President's Commission made its report. Shortage of trained personnel, medical and paramedical, is one of the more obvious obstacles to more rapid development of rehabilitation services in hospitals and elsewhere.

While the precise extent of unmet needs in rehabilitation is not known, various estimates are available.* The Office of Vocational Rehabilitation estimates that approximately 2,000,000 persons have disabilities requiring rehabilitation services to make them employable. (In 1951, the vocational rehabilitation program returned 66,200 persons to employment.) It is further estimated that each year 250,000 persons of working age "become in need" of vocational rehabilitation by reason of disease or accident. How many of these persons can be rehabilitated is not known. What proportion of the disabled

* America's Health Status, Needs and Resources. Vol. II. A Report to the President by the President's Commission on the Health Needs of the Nation. Washington, D. C.: Gov. Ptg. Office, 1953.

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persons could be helped toward increased self-sufficiency, and thereby become less of a burden on their families and communities, short of vocational rehabilitation, is again not known. The Commission on Chronic Illness is currently engaged in two studies of representative samples of the chronically ill and disabled population in Hunterdon County, N. J., and Baltimore, Md., to answer this question among others.

The results of these studies will be most valuable and undoubtedly will serve as an added stimulus to development of rehabilitation services. However, such studies will be useful chiefly as an index of the quantitative aspects of needed rehabilitation facilities; the need for some such facilities in many communities usually requires no extensive survey for its demonstration. All that is required is (first) some familiarity with what rehabilitation can and has accomplished for persons with various chronic disabilities and (second) some information regarding the prevalence of persons with such disabilities who are not receiving rehabilitation. To find such people, one need only visit any nursing home, county home, the infirmary of a home for the aged, or the dwellings of families receiving public assistance.

Where rehabilitation facilities have been set up, patients who can be helped invariably have appeared. Why, then, are we so slow in creating these facilities? What can be done about it and who is to do it? While no single answer to these questions would be adequate, the following partial ones are offered: Rehabilitation services are not being developed as rapidly as they should because most people responsible for the care and support of chronically disabled persons have only vague notions of what these services are and what they can do. The community forces and agencies that are or could readily become interested in supporting rehabilitation services are divided, chiefly by preoccupation with separate diseases. What is needed is some method of bringing these agencies together, informing them, and mobilizing their support. One of the local agencies to do this is the health department and the logical person, the health officer.

The development of rehabilitation services is a public health problem and function for the following reasons:

1. It is a health need which could be, but is not being adequately met. In other words, the ordinary forces of medical demand are not sufficient to supply the needed service.
2. The persons most in need of the service are least able to pay for it.
3. Education is needed to inform the public and the professions regarding what rehabilitation is and what it can accomplish.
4. Community support must be secured to establish the service.
5. Many different official and voluntary health and welfare agencies must be brought together both to mobilize their support and to integrate their services in the rehabilitation process.

Education, securing community support, and bringing and fitting together the services of other community agencies are all public health functions and responsibilities.

One of the more evident and pressing needs is that of rehabilitation of persons receiving public assistance under the aid-to-disabled program. A systematic appraisal and classification of the persons receiving such assistance in New York State has been undertaken by the State Department of Social Welfare, classifying the recipients into those who do and do not present some hope of rehabilitation. It is evident that before much can be accomplished in the way of rehabilitating the former, welfare commissioners and others responsible for the care of these people must be convinced of the desirability of attempting rehabilitation procedures and of making the indicated outlay of public funds for this purpose. When this is done, we also must make certain that

rehabilitation facilities are available. It is probable that some form of initial subsidy will be required to enable hospitals to make necessary physical alterations and install equipment for rehabilitation wards, to assure sufficient income from patients, and to provide some way of meeting the deficit which rehabilitation hospital facilities usually incur. These funds need not necessarily come from tax sources; there are many voluntary health agencies with funds available for rehabilitation of persons with specific diseases, which, if pooled, could help support a community-wide rehabilitation service.

In summary, in order to develop rehabilitation services in hospitals or in association with hospitals, what is necessary is an appraisal of the needs for such services which are not being met, particularly among persons already receiving public assistance in one form or another. Once the need is established and community support secured, the indicated next steps toward the establishing of rehabilitation services will become evident. The entire problem is clearly a public health function. Official health and welfare agencies have a definite responsibility for assuming leadership in meeting it.

Again the Social Sciences

Late in 1953 the Social Science Research Council created a Committee on Preventive Medicine and Social Science Research "to explore possibilities for developing research on social aspects of preventive medicine." Its chairman is Hugh R. Leavell, M.D., professor of public health practice, Harvard School of Public Health, and president of the American Public Health Association. Also included on the seven-man committee is H. Van Zile Hyde, M.D., chief, Division of International Health, Public Health Service.

The Social Science Research Council, organized as a private corporation, has a 30-year history with the aim of advancing knowledge concerning human relations through development of research in the social sciences. Among its activities, it supports programs of research training fellowships, faculty research fellowships, and makes grants-in-aid to research projects of individual scholars. More than 40 per cent of its 1952–1953 expenditures of nearly $850,000 was devoted to fellowships and grants-in-aid.

Pendleton Herring is president of the council which has offices at 230 Park Ave., New York 17, N. Y.

Action Areas in Rehabilitation

Rehabilitation Interests of a Voluntary Agency

HART E. VAN RIPER, M.D., F.A.P.H.A.

A point brought out in this paper is that three-quarters of all patients, who might profit by rehabilitation, must be cared for in their own communities and without benefit of established rehabilitation centers. In abbreviated form, what one nation-wide agency is doing to help meet this problem is told here.

✠ Many voluntary agencies in the health field today are centering their interests around the problem of rehabilitating persons who are handicapped by a disease or type of injury. Whether the handicap is a result of hereditary factors, congenital defect, or subsequent disease, injury or environment does not alter the fundamental pattern of attacking the problem. In every instance there is need for research and teaching in the areas of cause, prevention, aftereffects, and treatment.

Concern for the total care of the patient is reflected in the trend in medical education and practice throughout the country and in the attitude of the public which supports these programs. A number of terms, none entirely satisfactory, are used to describe this trend, such as total medical care, comprehensive medical care, and rehabilitation. A National Foundation for Infantile Paralysis Study Committee took exception to the phrases "Total Medical Care" or "Comprehensive Medical Care," as there are many aspects of the complete care of the patient which are not medical.

It was noted that rehabilitation is not a new word; nor is it a new idea. Unfortunately, the trend has been to narrow its meaning by assigning it to: a particular period of the patient's treatment, a specific group of technics, a specialty field in medicine, or even a type of therapist. The result is considerable confusion on the part of the medical profession, the medical auxiliary groups, and the public.

The committee, therefore, decided that the first step in its deliberations must be to define "Rehabilitation." Dissatisfaction was expressed over the widely accepted definition of rehabilitation which states that: "Rehabilitation is the restoration of the handicapped to the fullest physical, mental, social, vocational and economic usefulness of which they are capable."

It was the consensus that the word restoration is misleading. It implies a return to a previously existing condition and few handicapped persons can be restored to their former state. Moreover, it is not a suitable term to apply to the treatment of persons with hereditary or congenital defects or birth injuries. There was objection to the use of the phrase "fullest physical . . . usefulness . . . of which they are capable," for this is not always practical. It was pointed out that the development of "individual capacities" is not enough. The patient's desire, interests, and goals must be considered.

The definition finally developed by the committee states simply: "Rehabilitation is the process of assisting the individual with a handicap to realize his

potentialities and goals, physically, mentally, socially and economically."

The NFIP has recognized from the beginning that although the prevention of the disease was the final objective, the provision of the best available care for the patient and the improvement of treatment procedures must parallel the effort to control the disease. Therefore, a triple program was undertaken encompassing research, medical care, and education.

Research was divided into the areas of virology, epidemiology, and aftereffects of the disease, with responsibility centered at the national level.

Medical care was developed as a dual responsibility: (1) arrangements and payment for patient care at the chapter level, and (2) policy formulation and consultation at the national level.

Education was approached from three standpoints: (1) informing the public concerning the disease, (2) providing the medical profession and the members of the auxiliary professions with current information on research and treatment, and (3) training additional professional personnel. Responsibility for education, except for the institute type, has been at the national level.

The lack of a sufficient supply of professionally trained personnel to undertake research and to care for patients has been and still is a serious obstacle to progress in meeting the health needs of this country. As an agency which has assumed responsibility for an attack on a specific disease, the NFIP also has considered it necessary to assume a responsibility to add to the total pool of qualified personnel on which it must depend for research, treatment, and education. Any other course could only spell failure or result in robbing other important agencies or institutions in the health field of essential personnel already employed in their programs.

The NFIP has made and is continuing to make a substantial contribution in reducing personnel shortages in those fields which have a relationship to poliomyelitis problems. As of September 15, 1953, there were, for example, 223 scholarship and fellowship students actively engaged in training programs for periods of from six months to four years duration. Since 1938, a total of 3,425 persons have received awards of similar duration for preparation in research, specialty, or postspecialty training in selected medical or surgical fields, and basic preparation for entering medical auxiliary fields such as physical therapy and medical social work. Recipients of these awards are not obligated to accept employment in poliomyelitis research or clinical programs caring for poliomyelitis patients. It is possible that the fact that these people were not forced to accept employment limited to the problems of a single disease has intensified their desire to be of service when they were needed.

It should be noted that awarding scholarships and fellowships is only a partial solution of the problem of personnel shortage. In addition, it has been necessary to give financial assistance to a number of professional schools and professional associations to recruit larger numbers of qualified students and to maintain standards of education and practice.

To accomplish the objective of rehabilitation of poliomyelitis patients, it likewise becomes necessary to disseminate to the professions concerned the increasing body of knowledge on research and medical care in relation to the specific disease. Two methods have been used for this purpose: (1) to pro-

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vide short refresher courses, and (2) to prepare and distribute printed materials and visual aids.

One of the most serious obstacles to the rehabilitation of patients with poliomyelitis or other handicapping diseases or injuries is the lack of coordinated effort between members of the medical profession; the medical professional and the auxiliary personnel (nursing, physical therapy, occupational therapy, medical social work, clinical psychology, etc.); and between the medical and auxiliary groups and the community agencies. The problems the NFIP has encountered in the rehabilitation of poliomyelitis patients show that at least 75 per cent of the patients who require assistive services must be cared for in their own communities and without the benefit of rehabilitation centers. It is clear, therefore, that if patients are to benefit from present-day developments in the field of rehabilitation, the concept of rehabilitation and the basic technics must become a part of the education of the medical student and the auxiliary personnel upon whom the physician must depend for the complete and adequate care of his patient. Therefore, support is being given to a number of medical schools to undertake the teaching of the concept and basic technics of rehabilitation as a part of basic medical education. The schools interested in initiating these projects are not asked to follow any preconceived program, nor is it suggested that they should establish special rehabilitation courses.

In closing, it should be emphasized that the experience of the National Foundation for Infantile Paralysis as a voluntary agency concerned with a specific health problem indicates that a broad approach must be maintained to solve the problems which arise in the prevention of the disease and the rehabilitation of the patient with the disease. It might surprise you to know that the support of research and education, to date, has been nearly equal—$20,500,000 for research and $18,900,000 for education.

Fluoridation and Chronic Illness

At its fifth annual meeting in March, the Commission on Chronic Illness urged that "American communities adopt fluoridation as a positive step in the prevention of the chronic diseases, dental caries." This action was taken on the basis of a review and evaluation of the available evidence by a committee of distinguished scientists as to the possible detrimental effects of fluoridation, particularly to the aged and chronically ill.

This committee of scientists was headed by Kenneth F. Maxcy, M.D., professor of epidemiology, Johns Hopkins University School of Public Health, and included Edward J. Stieglitz, M.D., geriatrician, and Nathan Shock, M.D., chief of the Section on Gerontology, National Institutes of Health. This committee reported that "extensive research into the toxicology of fluorine compounds has revealed no definite evidence that the continued consumption of drinking water containing fluorides at a level of about 1 p.p.m. is in any way harmful to the health of adults or those suffering from chronic illness of any kind. . . . If a risk exists at all it is so minimal and inconspicuous that it has not been revealed in many years of investigation."

Action Areas in Rehabilitation

Coordinated Planning in the Community

WILLIAM F. STEARNS

As a record of the success of a good cause that well deserved to succeed, this paper becomes a heart-warming historical document. In addition, it has much to say to others of us than those who are concerned chiefly or solely with rehabilitation.

✣ This is the case history of a community rehabilitation center. Such growth as it has attained may be seen to have been vitally nourished by an integrated combination of community resources. In 1935 three individuals, convalescing from tuberculosis in Saranac Lake, N. Y., conceived the idea of a program of educational therapy for local patients. They foresaw the benefits of creative purposeful activity in translating enforced physical confinement into opportunity for self-development and growth.

Obviously, the idea called for endorsement and support from the medical profession. In due course, one leading specialist, whose insight into the psychological complications of the rest cure was unusually acute, accepted the role of organizing chairman of the project. Letters were written to other local practitioners, personal interviews held with each, and lists of prospective students and instructors developed from their case records. The Carnegie Corporation of New York, a foundation noted for its sponsorship of experimental projects in adult education, made a grant of $3,000 for organizational purposes. As compared with present-day concepts, the objective of the Saranac Lake group was only a segment of the inclusive aim of a modern rehabilitation center program. That the original concept and its manifestation have been able to grow can be traced to peculiarly favorable factors in environment.

The village of Saranac Lake, with a population of 7,000, has grown up around what is locally known as "the health industry." It began its rise in the early 1880's when Dr. Edward Livingston Trudeau's sanatorium started to attract sufferers of tuberculosis from far and wide. One by one, private nursing homes and boarding cottages began opening in the village. Many physicians, treated in the sanatorium, upon discharge established local practices. As the village grew, all the normal aspects of community life developed with the accompanying employment opportunities in a variety of business and professional enterprises. During the period of expansion literally hundreds of men and women, following completion of treatment, yet aware of the dangers of relapse, settled in the community and contributed their skills and

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ambitions to its development. The village became in actuality an "industrial colony" which, through the labors of the physically handicapped and disabled, produced a thriving community.

It was in this setting then that the therapeutic values of adult education were to be demonstrated. Announcement of the organizational grant was followed by the calling of a town meeting. The name "Saranac Lake Study and Craft Guild" was adopted and officers were elected with a doctor as president. In January, 1936, operations began. The first step was a survey of the 1,500 patients in the area to determine their specific educational interests and to locate qualified teaching personnel. Three hundred and twenty-three patients indicated desire for instruction, and to assist in meeting the educational needs revealed in the survey 56 potential instructors volunteered their services.

Two months later organized instruction was initiated in centrally situated classes and at the bedside in sanatoria and nursing homes. At this time it was announced that class groups would be open to all adult residents of the village, irrespective of health status. This proved a farsighted decision which has proved of inestimable value in the restoration of confidence and self-respect to the physically handicapped and disabled. During the next two years the program became an integral part of community life and accepted medically as an important adjunct of treatment. In 1938 the corporation announced withdrawal of its support. At this critical time, the local superintendent of schools gained approval of the State Education Department for use of public funds in partial payment of guild teaching salaries through the Franklin County Vocational Education and Extension Board. However, with continued increase of enrollment heavy demands were placed upon the Board of Directors in meeting other costs. The community responded generously to appeals for local contributions. Paid membership in the organization grew from relatively few to over a thousand.

As it grew the guild became increasingly aware of the necessity for professional counseling and guidance on a highly individualized basis, if the educational program was to reach its maximum effectiveness. In retrospect, the establishment of the Department of Rehabilitation Counseling in 1944 is seen as a major step toward the development of the comprehensive rehabilitation center of today. With each succeeding year the community was becoming more involved in the program. The State Employment Service and local business men began assisting in the placement of discharged and convalescent patients. The welfare offices encouraged use of guild training facilities by recipients of public assistance. Hospitals and laboratories volunteered technical facilities for training.

Growth of the program was continuous. During the school year 1950–1951, 470 patients received more than 42,000 hours of instruction from a faculty of 35 part-time and full-time instructors. During the same year guild facilities were enriched through the acquisition by gift of a 30-room modern hospital building, fully equipped and in excellent repair. This addition to physical plant made possible the opening of a sheltered workshop in cooperation with the Altro Work Shops of New York City, the installation financed by a private foundation.

In 1951 the legislature created the Temporary State Commission on Special Services to the Physically Handicapped and Disabled in Saranac Lake and Surrounding Area, with the commissioner of education, the commissioner of health, and the director of the budget as members. The commission was instructed to define the local need

for rehabilitation facilities. This legislation encouraged the guild to embrace in its scope all areas of physical disability. In 1952 the Departments of Physical and Occupational Therapy were opened to serve the orthopedically and neurologically handicapped, and during the first 18 months of operation 233 new cases were admitted on medical prescription from 38 doctors.

In recognition of its broadened objectives the name of the institution was changed in 1952 to the Saranac Lake Rehabilitation Guild, and its act of incorporation was also legally amended to accommodate future growth as a comprehensive rehabilitation center.

Conclusions

The experience of the Saranac Lake Rehabilitation Guild suggests certain conclusions with relation to coordinated planning in rehabilitation:

1. Facilities should be founded upon recognized and evaluated needs.
2. They should define their areas of service with due relation to other community resources.
3. They should be developed with full understanding and support from the community.
4. They should not be possessive in attitude toward their patients and should make prompt referral to other resources as needed.
5. The integration of services should be continuous and dynamic, and based upon constant re-evaluation of needs and resources.

British Social Services Summarized

"Social Services in Britain" is prepared by the Reference Division of British Information Services. Its 40 pages give a clear outline of the content of social services which are listed in two main categories — contemporary personal services and environmental services. National insurance and allied services, marriage, and child guidance rehabilitation are among the first category; health, housing, and town and country planning make up the latter.

The discussion of the work of voluntary organizations indicates their parentage in mutual aid associations dating back as early as the 16th century. The experimental role of voluntary agencies as in this country is also indicated. "Many social services that are now provided by the government sprang from experimental pioneer work of voluntary organizations. A practice of cooperation between governmental and voluntary agencies has developed in many fields, and is typical of British institutions." The relation of voluntary and official agencies is described thus: "The structure of British social services is complex. In general, there is public responsibility for all services deemed essential, but within the essential social services, voluntary organizations participate in management. The voluntary services are, in the main, those not essential to life and health, but considered conducive to the enrichment of living."

British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. No information as to price.

Social Assistance Medical Care Programs in Canada

MALCOLM G. TAYLOR, Ph.D.

The ways some Canadian provinces have taken to provide medical care for the indigent will prove of interest to all on this side of the border whose work is complicated by the inadequacy of similer provisions in their own areas of operation.

✣ The nature of the problem of providing medical care for the needy in Canada is identical with that of the problem in the United States. It arises from the interrelation of poverty and illness, the rapidly increasing industrialization and urbanization of our society, the inadequacy of family resources of a largely wage earning population, the gradual aging of our population, and the increased costs of modern standards of medical care.

The constitutional framework is also similar—a federal system with a national government and 10 provinces with responsibilities for health similar to those in the United States. Equally important, we share with you as an element of our common heritage the tradition of the Elizabethan Poor Law of 1601. As one of my colleagues recently remarked, "Would that we could have celebrated the accession of Queen Elizabeth II by abolishing the Poor Law of Elizabeth I." Unfortunately, it has not yet come to pass.

One major difference in our governmental systems, however, is the contrast between your separation of powers theory, which makes the United States legislative and executive divisions separate but coordinate branches of government, and our union of powers theory, which requires that every public official be responsible to a minister who is a member of the majority in the legislature. The consequence of our system, as it relates to the organizational pattern for the provision of health services by government, was summarized in an editorial in Lancet in 1948, commenting on the establishment of the British National Health Service:

> When it declares that every citizen shall be entitled to the best available medical care, Parliament must make somebody (or some body) responsible for seeing that he can get it. Of the various possible recipients of this administrative responsibility the one that most appealed to the B.M.A., and to ourselves, was a British Medical Corporation which should enjoy the kind of autonomy given to the B.B.C. It was soon recognized, however, that whereas the B.B.C. lives on its own income a medical corporation would have to spend Exchequer money and would therefore have to work under the control of a Minister responsible to Parliament. Thus limited in independence, the corporation would in fact differ so little from a Government department that the difference in name would be immaterial.[1]

To round out this review of background, a recent major development in welfare in Canada was the revision of earlier national legislation, through the introduction of an old-age security program in 1952, to provide a universal flat rate pension for all over 70 as a matter of right and wholly unrelated to contributions. In addition, the federal government established a matching grant for public assistance on a means

test basis to those aged 65–69. Further, the federal government now provides 75 per cent of the cost of pensions to the blind, also available after a means test. In contrast to the United States, the Canadian federal government does not participate in programs of assistance for widows and dependents; nor is there any allowance for costs of medical care in any of these welfare programs.

As I have mentioned, the Poor Law tradition of municipal responsibility for the sick poor with its concomitant requirements of ascertainment of residence and application of a means test at the time that care is sought has been the practice in our country. It should be noted, however, that all public hospitals—and practically all our hospitals, voluntary and governmental, are "public" hospitals—provide care for indigents. We have not at any level of government established a separate system of hospitals for those who cannot pay. Rather, the provinces have adopted the practice of giving grants to public hospitals, calculated on a patient-day basis, to supplement municipal payments in meeting costs of providing care to those in need.

Beginning in 1933, however, one province and since World War II four other provinces have adopted programs which differ from this traditional approach in philosophy and in scope as well as in the transfer of responsibility to a higher level of government. Of these five provincial programs, two provide limited benefits and three provide a broad range of services. The two limited programs are those of Ontario, established in 1933, and of Nova Scotia, established in 1950. Contrary to the usual definition of limited benefits, these programs are restricted to the services of physicians in office or home. In Ontario this now includes home deliveries, certain laboratory procedures, and emergency drugs. Medical and surgical care in hospital continues to be provided as before, with the hospital administering a means test at the time service is obtained.

The three comprehensive public medical care programs are those of our three westernmost provinces—Saskatchewan, Alberta, and British Columbia. These are the provinces that have established government-sponsored hospital care programs for the general population. These three comprehensive programs are practically identical in range of services which include medical, surgical, and obstetrical services in office, home, or hospital, hospital care; dental care in Alberta and Saskatchewan; all necessary drugs in Saskatchewan and British Columbia; and ancillary services of optometrists, physiotherapists, and private duty nurses.

Since space imposes an eclectic approach, the aspects of these programs which appear to have relevance for an American audience will be grouped under four major heads.

Beneficiaries

While the Ontario program, introduced at the low point of the depression, originally covered only recipients of general relief, the major case loads of all five programs are comprised of those in receipt of categorical assistance. In each province, the groups covered are typically the following: (1) recipients of Old Age Security who pass a means test, (2) recipients of Old Age Assistance, (3) recipients of Blind Pensions, (4) recipients of Mothers' Allowances, and (5) recipients of public assistance to unemployables.

In Nova Scotia the program origi-

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Table 1—Number and Types of Beneficiaries, Provincial Social Assistance Medical Care Programs, Canada, 1952

Program	All Beneficiaries	Type of Beneficiary				
		Old Age Security and Assistance	Blind Pension	Mothers' Allowance and Child Welfare	Other	Public Assistance
All Programs	287,962	195,426	3,906	51,607	977	36,046
Limited						
Nova Scotia	8,479	..	733	7,746	..	..
Ontario	154,144	105,943	1,678	24,888	592	21,043
Comprehensive						
Saskatchewan *	30,861	20,584	740	9,537	..	†
Alberta ‡	30,800	24,800	800	5,000	200	..
British Columbia	63,678	43,618	551	4,506	..	15,003

* Fiscal year April 1, 1951, to March 31, 1952

† Recipients of social aid in Saskatchewan are covered in a separate program. During 1951-1952, 4,242 persons were eligible for services

‡ Average to the nearest 100

nally (1950) included those in receipt of Old Age Pensions, but in 1952 when the federal government introduced the universal pension for this group, the provincial government withdrew the benefits from it, leaving in the program only those receiving Mothers' Allowances and Blind Pensions. In Table 1 the types and numbers of beneficiaries in each program are summarized.*

Administrative Agency

The pattern established in 1935 by the Ontario government for the administration of physicians' services has been followed by the other provinces excepting Saskatchewan. The Ontario government entered into a contract with the provincial medical association for the provision of medical care to qualified beneficiaries for a stipulated sum of money, to be administered by the association or its agent. In Alberta the medical association office administers the medical benefits as a side line to its other activities. In Ontario and British Columbia, the associations have set up separate administrative agencies with boards composed solely of representatives of the profession. In Nova Scotia the program is administered by the physician-sponsored medical care plan.

In Alberta the government entered into a similar contract with the dental association for the provision and the administration of limited dental benefits, a consistent extension of the principle. Consideration was also given to a proposal for administration of the hospital benefit by the Alberta Hospital Association, but because the Alberta Blue Cross Plan had not then been established, the proposal was not adopted and the administration of the hospital benefits was vested in the Health Department. If the principle were to be extended to its logical conclusion, drug benefits would be administered by the pharmaceutical associa-

* It should be noted that in compiling the data relating to these five programs, it was necessary to obtain information from 11 agencies. In some instances, the data are not exactly comparable since some relate to a fiscal year and others to a calendar year.

tion, nursing benefits by the nurses association, physiotherapy benefits by the physiotherapists, and so on. Presumably, the added cost of the resulting fragmented and unnecessarily repetitive administration would be considered a price to be paid for the good will of the professions providing services.

In Saskatchewan the government adopted the attitude that this was a program which it must itself administer as a part of the total health program, but it recognizes also the essential role of the profession in its successful administration and it therefore relies for policy guidance and for the assessment of accounts on a three-member Central Medical Assessment Board which the association nominates and which the government appoints and pays.

From the point of view of the political scientist, this practice of handing funds over to a private agency for distribution among its own members, without government nominees on the board, or without even the safeguard of presumably competing or neutral public interests on a representative board, raises some important questions about responsible government. Certainly, this is not common practice in the expenditure of government funds. The public officials with whom I have discussed this question in each of the four provinces support the practice by maintaining that the profession can administer the program better because the association can discipline its members more effectively than can a government agency. The members of the profession, for their part, add to this the argument that in fact the programs are inexpensively administered and their administration costs appear to support this (Table 5). Furthermore, since patient complaints are presumably a good test of program satisfaction, the record is said to speak for itself, for complaints of any importance are seemingly nonexistent. On the other hand, the beneficiaries of these programs are probably the most inarticulate group of the population and, as the services they receive are gratuitous, it is not likely that complaints would be made—as they would be if the beneficiaries were paying premiums.

Whether precedents for the future have been established by this pattern is uncertain; it is a characteristic of British constitutional development that accepted conventions of tomorrow grow out of the exceptional practices of today. Certainly, in my opinion, this practice is exceptional: on the one hand, in the lack of direct government participation in or supervision of administration, and on the other, as an expression of government confidence in the administrative capacity of a professional body.

One other important issue on which opinion seems fairly evenly divided is whether this is a health or welfare responsibility. In three provinces—Ontario, British Columbia, and Nova Scotia—it is the Welfare Department that negotiates the contract with the Medical Association; in Alberta, the Health Department makes these arrangements, and in Saskatchewan, as I have indicated, it is the Health Department that administers the program.

Methods of Payment

In the payment for physicians' services in these programs the pattern is uniform. Each government agrees to pay a fixed annual per capita sum for all eligible beneficiaries. Each medical association, on its part, agrees to accept this amount as payment in full for all accounts submitted in accordance with the official fee schedule. Since this amount is, with one exception (Nova Scotia since 1952), insufficient to pay all accounts at 100 per cent of the fee schedule, prorating is resorted to (Table 4). Prorating is thus the Procrustean bed of medical economics by means of

which expenditures are made to conform with revenues. These per capita payments have been increased from time to time, in keeping with the steady increase in demand for service and increases in fee schedules, which have tended to reduce the percentage payment of physicians' fees.

This method of negotiating a fixed per capita amount for the payment of an indeterminate number of services is used only in one other type of service, namely, in the provision of the dental benefit in Alberta. The government pays to the dental association four dollars per year for each beneficiary, but the demand for service on the part of these beneficiaries, influenced in part by the requirement of certain partial payments by patients, has in the past fallen short of this amount. Procrustes' bed, for once, was too long. In the first four years a surplus in this fund of some $60,000 resulted which has been used by the dental association for a scholarship fund and for lectures by dental specialists. Laudable though these purposes may be, I question this use of public funds appropriated by the legislature for dental care of a specified group in the community, particularly when full use of these funds for their authorized purpose could easily have been achieved by reducing the amount of the partial payment required for such services as dentures or by otherwise increasing utilization of services, as has since been done. Recent experience in the Nova Scotia program suggests that they must also face this problem; presumably either the bed must be shortened or the benefits expanded.

In all these programs, as in all payment for medical care on a fee-for-service basis, the twin problems of review of medical accounts and the control of abuses are a challenge to the ingenuity and fairness of administrators. One of these programs, that of Ontario, has made a major contribution to administrative practice by its further development of the formula method [2] which assesses each physician's accounts in accordance with the patterns of practice established by his confreres, with due allowance for individual differences. It has the merit of largely removing the personal factor from the task of assessment of accounts, but it is probably adaptable only to payment for physicians' office and home calls. In all other professional services in the programs of the western provinces—for example, dental services, physiotherapy, and nursing care—payment is made in accordance with professional fee schedules negotiated specifically for these programs.

Payment for hospital services is also made directly to hospitals by the government administrative agency. In both British Columbia and Saskatchewan the agency is the provincial hospital care plan, so that no distinction is made between these individuals and self-insured beneficiaries. Equally important, hospitals are paid the same rates for these as for other patients. The costs of care are, of course, far in excess of what the insurance plan premium income would be, so that in both provinces the government pays into the hospitalization fund the actual cost of care provided. In British Columbia municipalities are required to pay a part of the cost on behalf of their municipal indigents. In Alberta hospitals are grouped into five categories for payment purposes, all hospitals in each classification being paid on a graduated scale of patient-day charges.

Utilization and Costs

Since the beneficiaries of these programs are characterized by either low income or old age, or both, and since these programs remove not only the economic barrier but the barrier of a recurring means test as well, high rates

Table 2—Number and Rate of Discharged Hospital Cases, Related Patient-Days, Average Length of Stay, and Patient-Days per 1,000 Beneficiaries, Provincial Social Assistance Medical Care Programs, Canada, 1952

Program	Discharges		Days of Care	Average Days of Stay	Days of Care per 1,000
	Number	Rate per 1,000			
Saskatchewan	10,709	341	216,476	20.1	6,893
Alberta	12,100	393	179,016	14.8	5,812
British Columbia	14,314	223	236,212	16.5	3,676

of utilization are obviously to be expected. Whether they are higher than they need to be is an unanswered question.

Hospital Services—Utilization rates of hospital services in two of the three western provincial programs as indicated in Table 2 are very high, particularly when compared with prevailing rates among the aged in the United States as shown recently by the Falk-Brewster studies.[3] The discharge rate in Alberta is 393 per 1,000 beneficiaries, in Saskatchewan 341 per 1,000; but, in British Columbia, only 223 per 1,000. Within the social assistance group, of course, the rate for those aged 65 and over is much higher. For example, the rate in Saskatchewan reaches 403 cases per 1,000, which compares with a discharge rate of 337 per 1,000 for all persons 65 and over in the general population.[4] Average length of stay is also high, ranging from 14.8 days in Alberta to 16.5 in British Columbia and 20.1 in Saskatchewan. The combination of high admission rates and prolonged stay results in an unusually large volume of care which in 1952 reached 6.9 hospital days per person per year in Saskatchewan, 5.8 days in Alberta, and 3.7 in British Columbia. The high rates in Alberta and Saskatchewan can best be explained by the presence of an adequate supply of hospital beds, a shortage of doctors in rural areas, a probable lack of alternative facilities, and the predominantly rural character of those

Table 3—Utilization Rates of Physicians' Calls, Provincial Social Assistance Medical Care Programs, Canada, 1952

Program	Annual Rate per 1,000 Beneficiaries			
	Total	Office	Home	Hospital
Limited				
Nova Scotia	2,005	855	1,150	..
Ontario	5,009	2,640	2,369	..
Comprehensive				
Saskatchewan *	8,442	2,100	801	5,541
Alberta †	6,981	1,670	920	4,391
British Columbia ‡	4,348	2,173	1,083	1,092

* Calendar year 1951
† Fiscal year 1950–1951; data for 1951–1952 not available
‡ Fiscal year, 1951–1952

two provinces. British Columbia's population is more concentrated in urban centers and its supply of beds somewhat more limited.

Hospital care in such quantities is, of course, expensive, reaching annual per capita totals of $49.47 in British Columbia, $37.80 in Alberta, and $52.82 in Saskatchewan. Surely these figures, considered in the light of the Canadian hospital economy, underscore the need for alternative facilities and programs of care.

Physicians' Services—From the data in Table 3, the effect of limiting the program benefits to office and home care, as in Ontario and Nova Scotia, is evident. The Ontario beneficiary receives 60 per cent more office calls and 150 per cent more home calls than does the beneficiary, for example, in Alberta. But the beneficiaries in two of the western programs are more than compensated by the exceptional volume of hospital care which also is reflected in the statistics of physicians' hospital visits. These reach 5,542 physicians' visits per 1,000 beneficiaries in Saskatchewan and 4,391 in Alberta. However, this pattern is broken in British Columbia where the hospital call rate is, by comparison, exceptionally low. These data do not include surgical care because payment for surgery is on an inclusive fee basis. We do not know the volume of hospital care received by these beneficiaries in Ontario and Nova Scotia, but it can be safely assumed that it does not reach the proportions now characteristic in at least two of the western provinces. Because of the methods of payment, expenditures for physicians' services are only indirectly related to volume of service. The annual per capita payments made by the respective governments and the per cent of total accounts submitted which these amounts pay are shown in Table 4.

Mileage payments for physicians' home calls to rural patients must be considered as part of the medical service. Mileage accounts for a relatively small part of the cost in four of the programs but a still substantial proportion (21 per cent) in Nova Scotia. It will be recalled that in 1950 and 1951 Nova Scotia included among its beneficiaries those receiving Old Age Pensions. So great were the accounts for mileage that in some months they ex-

Table 4—Medical Capitation Fund Payments, Approved Medical Accounts, and Per cent of Approved Accounts Paid, Provincial Social Assistance Medical Care Plans, Canada, 1952

Program	Medical Fund Payments (Per capita)	Per capita Medical Accounts Approved	Per cent of Approved Accounts Paid
Limited			
Nova Scotia	$ 9.96	$ 7.28	100
Ontario	10.84	9.86	86
Comprehensive			
Saskatchewan *	12.50	21.35	55
Alberta *	12.50	20.98	52
British Columbia †	17.50	27.53	61

NOTE: The current (1953-1954) annual capitation rates are: Ontario $12.60; Nova Scotia $9.96; Saskatchewan $15; Alberta $15; and British Columbia $18.50

* Fiscal year 1951-1952

† Calendar year, 1952

Table 5—Distribution of Medical Capitation Fund Expenditures for Medical Services, Mileage, and Administration, Provincial Social Assistance Medical Care Programs, Canada, 1952

Program	Capitation Fund	Expenditures *			Per cent of Total Fund		
		Medical	Mileage	Administration	Medical	Mileage	Administration
Limited							
Nova Scotia	$ 84,451	$ 44,036	$17,731	$ 5,912	52	21	7
Ontario	1,672,120	1,435,262	85,215	101,047	86	5	6
Comprehensive							
Saskatchewan †	389,792	372,827	16,965	‡	96	4	†
Alberta †	359,930	336,105	‡	12,437	93	**	3
British Columbia	1,109,783	1,071,950	‡	45,086	97	**	4

* Because of surpluses and late accounts carried over from the preceding year, expenditures do not necessarily equal the year's capitation fund

† Fiscal year 1951-1952

‡ In Saskatchewan costs of administration are not charged to the capitation fund but are paid by the government separately

** Not available

ceeded the total sum of money available for all services. These mileage accounts were associated chiefly with home calls to the aged and this appears to have been one of the major reasons for withdrawing benefits from this group in 1952.

As shown in Table 5, administrative costs are low, in part because the government assumes what might be called the "acquisition costs," and in part because of the strong incentive in the profession-administered plans to manage the programs as inexpensively as possible because money spent for administration must come from funds otherwise available for payment of medical accounts. It might be advisable for a government to earmark separate funds for each of these two purposes, so that the administrator is not presented with these competing demands for the same dollar.

Pharmaceutical Services—Data on

Table 6—Drug Expenditures, Saskatchewan and British Columbia Social Assistance Medical Care Programs, 1948–1952

Year	Saskatchewan		British Columbia †	
	Expenditure	Per capita Expenditure	Expenditure	Per capita Expenditure
1948–1949	$167,886 *	$6.06	$210,078	$ ‡
1949–1950	140,736	4.85	349,607	7.16
1950–1951	155,637	5.17	460,572	8.15
1951–1952	192,624	6.24	522,277	8.74

* 20 per cent partial payment imposed on December 1, 1948

† This represents the gross drug cost, including 20 per cent which is charged to the municipality of residence

‡ Not available

number of prescriptions are not available for British Columbia, but the utilization of drugs in the British Columbia and Saskatchewan programs follows the pattern of drug programs everywhere—a persistent increase in the annual number of prescriptions, reaching 4.6 prescriptions per capita in Saskatchewan last year. In 1951 there were one and one-half prescriptions for every home and office call made, in addition to the drugs provided in hospital. As is to be expected, drug expenditures have shown an even higher rate of increase (Table 6). This increase in Saskatchewan expenditures is of more than usual interest, for it occurred despite the imposition, in December, 1948, of a requirement that the patient pay 20 per cent of the cost of most drugs. For two years utilization remained fairly constant, but as Table 6 shows it took a significant jump in the fiscal years 1950–1951 and 1951–1952. In British Columbia the experience is similar, although no partial payment has been imposed. In three years costs more than doubled.

Unavailability or inadequacy of statistics of the use of other services precludes their presentation here. The costs of these other services are not, however, insignificant. In Table 7 the total costs of all the services provided in each program are summarized. The costs of these programs are substantial, particularly in the three provinces which provide comprehensive benefits. Total per capita costs of all services are as follows:

Nova Scotia	$ 9.96
Ontario	10.84
Saskatchewan	77.44
Alberta	53.76
British Columbia	76.89

Table 7—Annual Expenditures for Services, Provincial Social Assistance Medical Care Programs, Canada, 1952

Program	All Services	Type of Service				
		Hospital	Medical	Drugs	Dental	Special Services
	Annual Expenditures					
Total	$10,699,006	$5,944,511	$3,616,075	$714,901	$220,276	$203,243
Limited						
Nova Scotia	84,451	..	84,451	..	..	..
Ontario	1,672,120	..	1,672,120	..	..	..
Comprehensive						
Saskatchewan	2,390,011	1,630,171	389,792 *	192,624 *	72,301 *	105,123 *
Alberta	1,655,937	1,164,340	359,930 *	..	85,713 *	45,954 *
British Columbia	4,896,487	3,150,000	1,109,782	522,277 *	62,262 *	52,166 *
	Per capita Expenditures					
Limited						
Nova Scotia	$ 9.96	..	$ 9.96	..	..	..
Ontario	10.84	..	10.84	..	..	..
Comprehensive						
Saskatchewan	77.44	$52.82	12.50	$6.24	$2.34	$3.41
Alberta	53.76	37.80	12.50	..	3.15	1.49
British Columbia	76.89	49.47	17.50	8.20	0.98	0.82

* Fiscal year 1951-1952

Conclusion

This paper reviews organized programs in five Canadian provinces to meet the medical care needs of welfare groups. Two of the programs offer the limited benefits of physicians' office and home care, certain laboratory procedures, and emergency drugs. Three of the programs offer a comprehensive and practically complete range of benefits. These programs represent an assumption by provincial governments of what was previously a municipal responsibility.

The method of administration is such that individuals who have once passed a means test to qualify for categorical or general public assistance are not required to submit again to this procedure on every occasion that medical care is needed. The patient's relationship to the provider of service is that of an insured person in any prepaid medical care program that permits free choice of physician.

In one province the medical benefit is administered by the Health Department. In the other four provinces the administration of the medical benefits and in one, of the dental benefits, has been delegated to the association of the profession providing the services. Though this represents a substantial departure from accepted government practice, the theorist in public administration is forced to withhold judgment on the actual consequences of this method until armed with the results of a full-scale study.

While these programs are expensive, they represent an overdue acceptance by society that medical care is as important in meeting human needs as are the basic necessities of food, clothing, and shelter. They demonstrate that the community can organize its resources to provide medical care to those in need at standards higher than those currently obtained by a large segment of the self-supporting population. They are subject perhaps to the criticism that for a great many of these recipients this standard of service comes too late, for had it been available earlier they might not have been recipients of public assistance. These programs suggest, therefore, the importance of mobilizing community resources to meet more adequately the medical needs of all and, in addition, they provide valuable experience to guide us in the achievement of that end.

REFERENCES

1. Editorial. Lancet 1:143 (Jan.), 1948.
2. Sinai, Nathan; Hall, Marguerite; and Holmes, Royden. Medical Relief Administration. Final Report of Experience in Essex County, Ontario. Windsor, Canada: Essex County Medical Economic Research, 1939. (Contains a Complete Description of "the Formula Method" of Assessment.)
3. Falk, I. S., and Brewster, Agnes. Hospitalization Insurance and Hospital Utilization Among Aged Persons. Social Security Bull. Washington, D. C.: Gov. Ptg. Office (Nov.), 1952.
4. Fourth Annual Report of the Saskatchewan Hospital Services Plan. Regina, Saskatchewan, Canada: Department of Public Health, 1952, p. 15.

Cancer Lectures Abstracted

Beginning in 1954, "Cancer Alerts: Abstracts" is being published quarterly for the general practitioner as an expanded index to the best and latest available information on cancer. The abstracts consist of lectures delivered in the weekly postgraduate program of the New York Academy of Medicine. They are described as "ample enough to include the essentials, brief enough to be read in hasty convenience." Published jointly by the academy and the New York City Cancer Committee, "Abstracts" is available from the New York Academy of Medicine, 2 East 103rd St., New York 29. Price not stated.

Organization and Development of a Comprehensive Care Program

GEORGE G. READER, M.D.

To lead medical students to understand that patients are people, that people have families, and that family problems complicate illness, a New York hospital set up an integrated out-patient service described here in useful detail.

✣ In July of 1951 the New York Hospital-Cornell Medical Center established a program * for the more complete care of ambulant patients to correct a long-recognized defect in undergraduate medical education, i.e., the lack of opportunity for development of a significant doctor-patient relationship with patients whose needs transcend occasional and symptomatic therapy. Medical students today rarely see patients as individuals but rather as demonstrations of disease entities or examples of disordered parts of the anatomy. The concentration on the bed-patient in clinical teaching, too, tends to divorce the student from an understanding of the importance of the patient's environment both in the causation and management of his ills.

The ambulant patient who brings the aura of his daily surroundings through the door of the clinic with him and returns home after his visit provides the ideal subject with which to teach the importance of continuous, complete care. However, before ambulant patients can be properly utilized for teaching, certain alterations in the customary methods of hospital out-patient care are usually required. First, the patient must be made the focal point of medical care and his needs must be the guide to the application of medical services, rather than the needs and convenience of the hospital staff. Coordination of activities in behalf of the patient is also necessary and requires a disruption of departmental lines and a group effort that has often been foreign to the modern medical center.

If the effort of improving on customary methods is successful, it should result in coordinated medical care extending through time, and this may be denoted properly as "comprehensive." This means better care for patients than has usually been available and, as such, a significant advance in the science of medical practice.

Planning and Organization

Almost two years were spent in planning and organizing a program for comprehensive care at the New York Hospital before students were brought into it—in June of 1952. The several people charged with the responsibility for planning began by giving thought to an optimal arrangement for the care of the ambulant sick. From this contemplation of Utopia certain principles emerged:

1. On each hospital visit the ambulant patient should come to the same familiar place and see the same familiar and friendly faces.
2. One physician should see the patient at every visit and by appointment.
3. All patients should be considered as candidates for total care, including attention to social and emotional needs.

* Generously supported by the Commonwealth Fund of New York.

4. Patients should be seen as part of a family constellation, with well members of the family receiving preventive care as far as that is possible.

5. Hospital services should be extended into the home where appropriate, not only so that the patient's environment may be better visualized but also that hospital beds may be saved for the more acutely ill.

A plan was devised following these principles but adapted to the reality of the New York Hospital situation. There, departments and subdepartments have grown and flourished until the care of an individual patient is often the responsibility of as many as four or five different clinics, each interested in only one aspect of the patient's total problems. The most direct approach to this Gordian knot of intertwined specialties would have been the establishment of an additional clinic for the complete care of a select number of patients. Because such a clinic could serve as a model but might never influence other parts of the hospital organization, this temptation was avoided. Instead, the General Medical and General Pediatric Clinics were selected for the start of operations.

In preparation for the introduction of the concept of comprehensive care, regulations for the General Medical Clinic were revised so that all outpatients were channeled through this clinic before assignment to the subspecialties. Only patients with dermatological or allergic complaints were omitted from this requirement. A "stat clinic" was also established to care for those patients whose complaints required immediate therapy and yet where a prolonged diagnostic study was not necessary. Gradually, the General Medical Clinic has become a place where complicated diagnostic problems can be solved or where continuing medical care can be given to those patients requiring it without the pressure of urgent patients and the disruptive influence of too large numbers.

Details of student teaching have been described previously and need not be repeated.*

Patient Care

All patients in the Medical and Pediatrics Clinics are considered candidates for comprehensive care. This represents some 3,600 patient-visits a month † and discrimination must necessarily be exercised in applying all the facilities of the Comprehensive Care Program to these patients. The detailed study of home, of family, and of life situation is more relevant for some patients than for others, just as use of all possible diagnostic tests for a single patient is only rarely necessary. Development of judgment in the use of comprehensive care has been considered one of the most important aims of the program.

In order to provide models for students on which to demonstrate the advantages of complete care, however, certain patients have been designated as Family Care Patients. These are selected according to the following criteria: (1) that one family member have an illness requiring continued medical supervision, (2) that preference be given to families which include young children, (3) that the families live within a reasonable distance of the New York Hospital, and (4) that the social problems of the family be not overwhelmingly complex. These patients are studied intensively by the student-physician assigned and are passed from

* Reader, George G. Comprehensive Medical Care. J. M. Educ. 28:34 (July), 1953.

† May, 1953.

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student to student indefinitely, each student having from one to three such families under his care. There are now 76 families being cared for in this fashion.

Home Care

Home visits are made when appropriate on all family care patients, but home care is considered a separate service of the hospital to which patients are admitted and from which they are discharged as in other clinical services. Patients are selected for home care if they have an illness which may be treated at home and where visits to the hospital are inadvisable or difficult. Family care patients have first priority for admission to the home care service but other patients may be admitted and preference is given to patients who may be discharged from the hospital to home care, thus releasing beds for patients who are more acutely ill. The average census at present is five patients. Although the home care experience represents an integral part of the teaching, it has been considered important to avoid a large number of such patients who would incur much traveling by the students to the detriment of other learning experiences. One home care patient for each student during a semester may be optimal and this can probably be accomplished with a home care census of 15–20 patients.

Because the home care service is designed primarily for teaching and because of its small size, it has not been considered necessary or desirable to contract for ancillary services at the present time. Rather, the Comprehensive Care and Teaching Program staff has attempted to coordinate the activities of agencies regularly engaged in the assistance of people in the community, such as the Department of Welfare, Visiting Nurse Service, Community Service Society, etc. Special individual services may be paid for as required out of a fund allocated to that purpose.

Standards of care are maintained and coordination achieved through staff meetings held at regular intervals. At a history meeting each week charts of all active family care patients are reviewed by the full-time staff. Home care charts are subject to more frequent review. An intake meeting is held twice a week at which new patients are proposed for home care or family care and accepted or rejected by vote of the group. Home care patients are only accepted if the initial examination can be carried out at the hospital and after investigation of the home situation by a social worker.

At the conference held for all students each week a student physician presents one of the families under his care and there is general discussion of the problem by members of the staff. In addition, teaching seminars are held once monthly for review of family care patients and home care patients with the students.

Because administration of a comprehensive care program encompasses so many disciplines and crosses so many departmental lines, the planning group devised a nondepartmental organization directly responsible to the Joint Administrative Board of the Medical Center. The president of the Joint Administrative Board appointed first an Advisory Committee composed of the chiefs of the clinical services, the professor of preventive medicine, the director of social service, the chairman of the Out-Patient Department Committee, the superintendent of the hospital, the dean of the Medical College, the dean of the Nursing School, and himself. The Advisory Committee then designated an internist as director of the Comprehensive Care and Teaching Program and assistant directors for medicine and pediatrics. A full-time resident physician and pediatrician, and a nursing service co-

ordinator and social service coordinator were also named. Four half-time consultants in surgery, psychiatry, obstetrics and gynecology, and preventive medicine were appointed by their respective department heads.

Figure 1 illustrates the administrative organization and its interconnections.

Duties of the Staff Members

The director has responsibility for over-all supervision and coordination of the program and is ultimately responsible to the clinical department heads for the care the patients receive. He brings to the Advisory Committee questions of policy and keeps the various members informed of general progress in the areas of individual interest to them.

The assistant director for medicine is in charge of the General Medical Clinic and responsible to the director for the care of all adult patients under the program and for students' activities in the Medical Clinic and on visits to the home.

The Pediatric Clinic is under the charge of a full-time clinical director who is not on the staff of the Comprehensive Care and Teaching Program but who works closely with it. The assistant director for pediatrics provides liaison with that department and is responsible with the pediatric OPD director for the teaching activities in the General Pediatric Clinic and on home visits to pediatric patients.

The resident physician and resident pediatrician teach in their respective clinics and help in supervising the care of patients. They are directly responsible for home visiting and usually accompany the students on house calls. They alternate nights and week ends on duty in order to give complete coverage.

The social work coordinator carries on liaison with community agencies and keeps in touch with all social work activities of the program. Medical social workers assigned to the Medical and Pediatric Clinics keep the coordinator informed of the problems with which they deal. An important part of her work is participation in group conferences and in individual consultations with the students about their patients. Here a highly effective kind of teaching

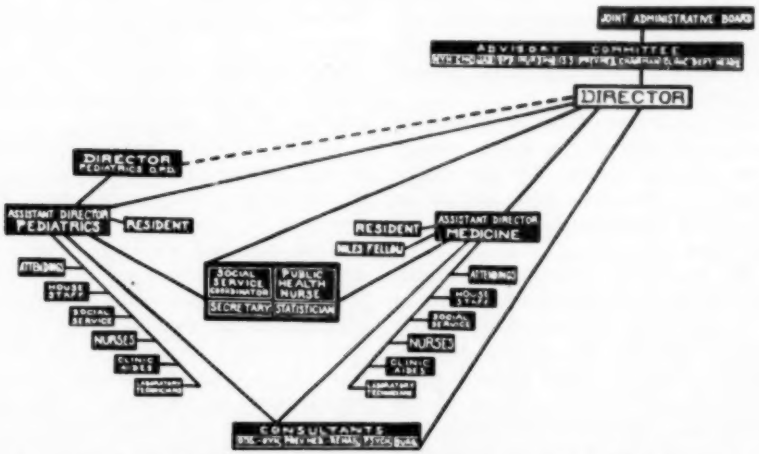

Figure 1—Organizational Plan—Comprehensive Care and Teaching Program

can be carried out without the need of being either didactic or theoretical.

The nursing coordinator likewise maintains liaison with hospital nursing staff and with community nursing agencies, participates in group discussions, and is available to students and patients for conferences on problems of nursing. In addition, she acts as the person to whom patients may telephone during working hours in the event of an emergency. Outside of clinic hours, calls are taken by the head nurse in the emergency room and relayed to the resident on call.

The surgical consultant is responsible for consultation service to both the Medical and Pediatric Clinics. When he is unable to appear himself, he is responsible for providing a substitute. He is also available for the occasional house call where surgical advice is required.

The consultant for obstetrics and gynecology is responsible in the same way for gynecological consultations. In addition, he supervises the prenatal care of those family care patients who become pregnant and follows them with the student physician in the General Medical Clinic. The same routines established for the antepartum clinic are followed and the student physician participates in the delivery of the patient and care of the infant.

The preventive medicine consultant participates actively in group conferences and discussions. He also makes rounds in the clinic and advises on preventive measures for the care of individual patients.

The psychiatric consultant is primarily a teaching consultant whose mission is to point out the use of psychiatric skills in handling the average medical patient. When a mental illness is diagnosed, he advises on referral of the patient for appropriate psychiatric care but does not himself give psychotherapy to patients.

A study section has been operating continuously since the initiation of the program in an attempt to record the activities of the program and evaluate them in terms of effectiveness of teaching and of patient care. Results of this work will be reported separately.

Accomplishments

Coordination of teaching and patient care in medicine and pediatrics has been a striking achievement of the program. Pediatrics has long been far ahead of other clinical disciplines in recognition of the importance of the patient's family and in emphasis on preventive medicine in the everyday management of patients. This has served as a valuable example to those in charge of adult patients and has greatly influenced the development of family care. Likewise, the pediatricians have gained from being exposed to the broader concept of medical care involved in dealing with people at all age levels.

The Departments of Obstetrics and Gynecology and of Surgery have also made a gratifying contribution. The tremendous advantage of having consultants immediately available in the Medical and Pediatrics Clinics has been apparent to all. Psychiatric and preventive medicine consultants, too, have helped immensely, particularly in the teaching of their disciplines.

Raising the nurse and social worker to full partnership with the physician in directing patient management has produced a significant alteration in medical care and teaching. The constant seeking of the nurse to find and fulfill patient needs and the nondirective approach of the medical social worker have come as a revelation to the physician who is ordinarily blinded to total patient needs by his desire to diagnose a disease entity and overpowered by his urge to treat the patient actively. Constant conferring among physician, nurse,

and social worker has produced a new understanding and respect for the contributions of each and a new concept of medical care better than the sum of its individual parts. Learning in this situation for medical student and physician, nurse and social worker, has been most effective.

Summary

The Comprehensive Care and Teaching Program of the New York Hospital-Cornell Medical Center is now in its second year of full-scale operation. It was designed to improve the teaching of undergraduate medical students as a laboratory course in patient management providing a synthesis of all the disciplines to which a student is exposed during the preceding three years of medical school. In addition, it has proved a cohesive and integrating force in the life of the center and has given a select group of patients a centralized, continuous, humane kind of care that may be tentatively considered a distinct improvement in medical practice.

ACKNOWLEDGMENT—Special appreciation is due David P. Barr, M.D., for his interest and helpful criticism in the preparation of this report.

New Technic in Typhoid Fever Investigation

A new type of detective work to discover the source of localized typhoid fever has been used in Monroe County, N. Y., for what is believed to be the first time in this country. This technic had been used previously by the British.

The study in Monroe County was conducted by Dr. Robert W. Bacorn, district health officer, in the vicinity of Spencerport. It was stimulated by the observation that a sporadic case of typhoid fever in that area had used water from a nearby stream for drinking purposes. Review of the typhoid record indicated that two other sporadic cases had occurred in the vicinity of the same stream in recent years. The source of these cases was not determined despite intensive epidemiologic investigation although the possibility existed that they also had acquired their disease from the stream.

The recent development of a useful laboratory procedure for studying stream and sewage pollution made it possible to explore the source of these cases. The technic involves the use of a swab, impregnated with selective culture media, which is left in the flowing sewage for a period of days. Laboratory identification of S. typhi is then possible. Positive swab samples were obtained from the Spencerport sewage effluent which is discharged into the stream. Isolation from the samples of typhoid bacilli of the same bacteriophage type D-4 as those recovered from each of the typhoid cases confirmed the suspicion that residents of Spencerport, a village of 2,000, were the probable source of contamination. This clue was pursued through the village sewer mains, the chain of positive swab results leading the way. This allowed exclusion of several branches of the sewerage system and eventual concentration of attention on a single block of the village.

In exploring the possibility of a carrier resident, it seemed logical to examine the inmates of a convalescent home located in that block. Thus far, stool specimens have been studied from 18 of the 24 occupants. Three were found to be carriers of S. typhi type D-4. Further studies will be made to determine whether all three persons are chronic carriers.

Methods for Analyzing and Interpreting Physical Measurements of Groups of Children

A. HUGHES BRYAN, M.D., F.A.P.H.A.

To the reader, other than a student of the field of biometrics, this paper will serve chiefly as a wholesome reminder of the fallacy of jumping to broad assumptions from casually compared "facts." The word "covariable" should be the alert that warns against untenable conclusions.

✣ It is generally accepted that dietary intake and the level of nutriture play an important part in determining the bodily growth of the young, and this point of view is supported both by studies of the growth of children and by the results of those who work in the field of animal husbandry. In the human instance, observations in a child caring institution by Corry Mann [1] in 1926, together with studies of British school children by Orr and his collaborators [2-4] from 1928 to 1930, clearly indicated that growth rates could be increased by dietary supplements which presumably improved the level of nutriture. On the other hand, it has long been evident that nutriture is, at best, only one of a number of factors which modify child growth. Thus, if we wish to draw an inference regarding nutriture from growth studies or, conversely, to observe the effect of changes in nutriture upon growth rates, we must take into account the possible effects of growth determinants other than nutrition.

In our approach to a solution of the problem of the relation of nutriture to growth we may choose to study individual children or we may seek to analyze the growth of groups of children, subjected as groups to the action of similar or differing growth determinants. The methods presented in this paper are designed for the latter approach. In studying groups we still have available two lines of procedure: we may collect cross-sectional data and study attained heights, weights, and other measurements, or we may set up longitudinal observations in order to analyze increments of growth. Space does not permit a discussion of the relative merits of the cross-sectional and the longitudinal procedure. Each has its inherent advantages and examples are offered below of the analysis of data derived from both types of study.

Before presenting a brief description of some of our methods, I wish to acknowledge that the work presented in this paper could not have been accomplished without the extensive help of skilled biometricians. I have been fortunate in having the constant collaboration of Bernard G. Greenberg, Ph.D., and Manindra Ghosh, Ph.D., has undertaken the solution of a difficult problem in multivariate analysis which arose from our experimental data and which will be briefly described.

Finally, in order that the reader may plunge into the heart of the matter, I have relegated to an appendix of this paper a number of important, but per-

Table 1—The Effect of Adjustment of Group Mean Weights to a Common Age. Based on Measurements of 347 Boys Aged 96–143 Months (8.0–11.9 Years) Divided into Five Socioeconomic Classes

Socioeconomic Class	Age (Months)	Observed Group Mean Weight (Pounds)	Group Mean Weight Adjusted for Age 118.55 Months (Pounds)
Urban I	118.6	83.5	83.4
Urban II	117.6	69.8	70.4
Urban III	118.6	68.3	68.3
Rural NF	117.2	66.4	67.3
Rural F	124.8	67.6	63.4

haps less interesting details regarding methods of collecting growth data.

Application of Analysis of Covariance to Measurements of Growth

In the technic of analysis of covariance we have a statistical tool which is well suited to the purpose of comparing and contrasting the mean growth measurements of groups of children. Dr. Greenberg and I used this method of analysis in a study of the differing growth patterns of children from varying social and economic backgrounds.[5-7] The advantages derived from the application of the analysis of covariance to such data may be briefly summarized as follows:

1. If age is used as the independent variable, and height, weight, or another measurement as a dependent variable, it is possible to obtain for the groups of children to be compared unbiased estimates of height for age, weight for age, etc.; estimates which are not affected by differences between the groups in their mean ages. As an example, consider the data in Table 1 which presents the group mean age, observed weight, and weight adjusted to a common age of 347 boys divided into five socioeconomic classifications. It is at once apparent that the mean ages of the groups differ significantly, despite the fact that the sample represents all boys within these age limits in a certain school system. The adjusted group mean weights (group mean weights adjusted for age) in the last column are directly comparable and are, for this purpose, notably superior to the observed mean weights, especially in regard to the two rural groups.

2. A second advantage offered by the technic of analysis of covariance is that it provides a convenient test of the significance of differences between adjusted group mean measurements. The test is also an efficient one since it removes from the total variance of the observed measurements that part which is contributed by individual differences in age. This is a matter of some importance when the samples studied include children selected over an age span of three or four years. In the example cited in the previous paragraph and in Table 1, the differences in the

Dr. Bryan is professor of public health nutrition, School of Public Health, University of North Carolina, Chapel Hill, N. C. This paper was presented before a Joint Session of the American School Health Association and the Food and Nutrition, Maternal and Child Health, and Statistics Sections of the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 11, 1953.

adjusted mean weights of the five groups of boys appeared to be significant at the 1 per cent level.

3. Finally, when we employ analysis of covariance we may choose our samples for comparison from children varying in age by as much as four years. This statement is subject to the restriction that the regression of the dependent variable upon the independent variable (in the example cited, the regression of weight on age) must closely approximate a straight line if we are to avoid the more tedious computations necessary in the curvilinear case. Greater latitude in setting the age limits of samples suitable for comparison obviates the added expense and inconvenience which would result if we were forced to draw our samples from children of very nearly the same age.

Certain assumptions are made and hence a number of conditions must be met when analysis of covariance is used as a statistical method. The interested reader is referred to other papers [7, 8] for a discussion of the extent to which these conditions may be fulfilled in applying the analysis of covariance to growth data.

Thus far, we have mentioned only the case in which age is selected as the independent variable, but other measurements, such as height or possibly skeletal age, etc., could be so employed. Also, a dependent variable such as weight may be adjusted at once for two independent variables, for example, height and age. When the latter procedure is followed we are comparing the mean weights of groups of children with both their age and their height held constant. In other words, our process of adjustment removes from the differences in observed mean weights not only that part which is attributable to age differences between groups, but also that due to group differences in height. Similarly, our test of significance in this case is refined by removing those two components from the observed variance of the growth measurement.

Influence of Socioeconomic Factors on Growth

Since the very beginning of anthropometric studies of children, it has been evident that boys and girls from different social strata differ significantly in their patterns of growth. The data presented in Figure 1 are drawn from one of our studies of growth by social class in North Carolina school children [7] and serve to illustrate both the use of covariance analysis and the differences in body size to be found in children from different environments.

In carrying out this study body measurements were made of all white children between the ages of 96 and 143 months (8.0–11.9 years) attending public elementary schools in a small city in North Carolina. The resulting samples of 347 boys and 330 girls were then subdivided into five socioeconomic groups. For this purpose, a survey of housing was used to separate the urban dwellers into three groups corresponding to the layman's use of the terms upper class, middle class, and lower class; the rural children were assigned to the farm or nonfarm classification on the basis of the occupation of their families. Some of the data on boys' weights have been presented in Table 1 and a more complete account of the study will be published elsewhere.[7] An examination of Figure 1 will reveal the extent to which the average measurements of boys and girls from each social grouping depart from the means for all children studied in respect to three measurements, height and weight adjusted for age, and weight adjusted for height and age. The technic of analysis of covariance was used to provide estimates of the adjusted group mean measurements portrayed in the graph and to test the significance of differences

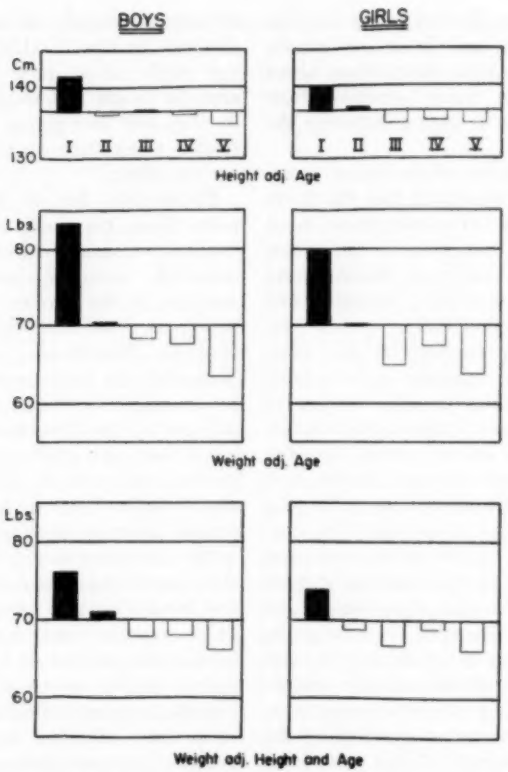

Figure 1—Group mean heights adjusted for age, weights adjusted for age, and weights adjusted for height and age of boys and girls 96–143 months (8.0–11.9 years) old and divided into five socioeconomic classifications. I, urban upper class; II, urban middle class; III, urban lower class; IV, rural nonfarm; and V, rural farm. The adjusted mean measurement for each group is shown as a solid bar if it is greater, and as a hollow bar if it is less, than the average value of the measurement for all children

between these means. The latter part of the analysis indicated a high degree of probability that for both boys and girls the subgroups were in fact different in respect to the three adjusted mean measurements. The graph also demonstrates the uniformly greater body size of urban upper class children, a finding which is in accordance with results in the literature. As portrayed in Figure 1, weight differences between social groupings of children appear proportionally greater in magnitude than height differences.* In this connection, however, it must be remembered that weight is more variable than stature,

* In preparing Figure 1 it seemed desirable to select scales for height and weight measurements so that a bar of the same height would represent a difference between group mean and population mean of say 5 per cent of the population mean. It was found that such a relation of the height scale to the weight scale resulted in an unsatisfactory graph, and the scales adopted are such that height differences appear, to the eye, twice as great as they should for direct comparison with weight differences on the basis of their proportionate part of the population mean.

even when it is adjusted for age, or for age and height, and hence we cannot conclude from this observation alone that weight is more sensitive than stature in discriminating between the classes.

Although studies from many countries have demonstrated that the body size of children varies with their social and economic backgrounds, the causes of this almost universal finding have never been completely isolated and evaluated. Undoubtedly, we are including in our concept of the socioenvironment a complex of correlated factors influencing growth. A list of the more obvious of these determinants would include, among others, heredity or race, diet and nutriture, health as a positive attribute as well as a limiting factor if disease is present, housing, recreation, the conditions of work, and the psychological and emotional climate with its well known physiological implications. If we wish to explain the relationship between child growth and the socioenvironment, further studies will be needed in which the experimental design will allow an appraisal of the influence of several of the correlated growth determinants now grouped together under the term socioenvironment.

Determination of the Stage of Sexual Maturity

Sexual maturation in children is associated with profound changes in their growth rates so that puberty is characterized by an acceleration at first and then a declination of growth in weight and height. Since these phenomena occur in different children at different chronological ages, and since the hormones responsible for sexual differentiation also exhibit such marked effects on growth, it is not wise to carry out anthropometric studies of children of school age without including a determination of the stage of maturity of the subjects measured. It is quite possible that two groups of children of similar age might show quite definite differences in height and weight by virtue of the fact that one group has progressed further along the road to maturity than has the other.

Fortunately for us, there are sign posts along the road, for the somatic changes of sexual development can be observed, recorded, and the results analyzed by the familiar technic of bioassay, as was first demonstrated by Hogben, Waterhouse, and Hogben.[9] With girls the progress of maturity can be recorded by the time sequence of changes in the development of breast, pubic hair, and axillary hair as well as by the occurrence of menarche, and we can utilize a four- or five-point rating system to record developmental changes in the first three traits.* Similarly, in the case of boys, puberal development can be studied and recorded by means of a six-point scale for rating pubic hair, a four-point scale for axillary hair, and a system for recording successive changes in genital development.* When such data, obtained by examining a group of boys or girls, are analyzed by one of the statistical technics of bioassay, we can estimate for the group the mean age of attainment of one or more of the above somatic traits associated with sexual differentiation. It should be noted that this procedure is designed for cross-sectional observations. In the case of long-term longitudinal studies, the average age of the appearance of such a somatic trait is most efficiently estimated by a simple arithmetic mean, provided that all members of the sample have already passed through this stage of development.

Perhaps the application of the methods of bioassay to maturity data

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* Further details regarding the methods of recording and analyzing data related to puberal changes are given in a previous paper.[10]

Table 2—Calculation of 50 Per cent Immaturity Points in a Sample of 97 Girls

Age at Last Birthday	Number	Per cent Immature with Respect to			
		Breast	Pubic Hair	Axillary Hair	Menarche
9	11	82	100	100	100
10	22	50	82	95	100
11	17	35	53	71	94
12	21	0	15*	62	71
13	26	4	4*	16*	35
50 Per cent Immaturity Points					
Method of Probits		10.6 ± .24	11.5 ± .18	12.5 ± .20	13.1 ± .19
Karber's Method		10.7 ± .23	11.5 ± .20	12.4 ± .19	13.0 ± .18
Method of Logits		10.7 ± .22	11.5 ± .19	12.5 ± .21	13.1 ± .18

* Based on n-1 observations

can best be explained by citing an illustration. In Table 2 data from a previous publication [10] are presented. The sample of 97 girls is divided into five age classes, and the table indicates for each age the proportion of girls immature with respect to breast, pubic hair, axillary hair, and menarche. From these proportions, 50 per cent immaturity points were calculated for each trait by three statistical procedures commonly used in bioassay with the results noted in the lower part of the table. The 50 per cent immaturity point is defined as the age at which 50 per cent of the population are immature in respect to a given trait and 50 per cent have begun to show changes associated with sexual development. From the analyses presented in Table 2 we learn that the average age of beginning breast development was approximately 10.7 years; of pubic hair, 11.5 years; of axillary hair 12.5 years; and of menarche 13.1 years. Thus we have four different criteria for stating the average age of sexual differentiation of this sample of girls and the findings could be compared with similar estimates obtained by studying a group of girls from a different environment.

The tool is a flexible one. We need not be limited to 50 per cent end points—according to the distribution of the data we may calculate and compare 30 per cent end points, 70 per cent end points, etc. Furthermore, in instances where somatic traits associated with puberty are recorded by a four- or five-point rating system, we can calculate end points other than the immaturity point. For instance, in an unpublished study of 160 ninth grade white boys, the development of axillary hair was rated on a four-point scale where 1 signified the infantile state, 4 adult profusion, and 2 and 3 were successive intermediate stages. With these data three end points representing different portions of the maturity spectrum could be calculated:

1. The 50 per cent immaturity point (I. P_{50}). Age at which 50 per cent of the population had axillary hair rated 1, and 50 per cent axillary hair rated 2, 3, or 4.

2. The 50 per cent transitional point (T. P_{50}). Age at which 50 per cent of the population had axillary hair rated 1 or 2 and 50 per cent axillary hair rated 3 or 4.

3. The 50 per cent maturity point (M. P_{50}). Age at which 50 per cent of the population had axillary hair rated 1, 2, or 3 and 50 per cent axillary hair rated 4.

The values of these end points, as obtained by the statistical method of logits were:

I. $P_{.50}$	14.2 ± 0.23 years
T. $P_{.50}$	15.1 ± 0.15 years
M. $P_{.50}$	16.0 ± 0.28 years

It is possible by the procedure here described to determine whether or not two samples of boys or girls differ significantly in their mean age of onset of the somatic changes of puberty. Many studies have indicated that in a given population the taller and heavier children experience an earlier puberty, but we lack conclusive evidence that children from the favored social classes, who are always found to be taller and heavier than those from less favored homes, do in fact attain sexual maturity at an earlier age. In the past many studies have used as a measure of the group mean age of puberty the date of first menstruation as remembered by girls sometime after that event occurred. We believe the methodology briefly described in this paper to be both more accurate and more objective.

Observations recording the appearance of the physical traits of puberty also can be used in studies relating such variables as growth increments, blood chemistry, etc., to the process of maturation rather than to chronological age. In other words, we can determine the mean height increment, weight increment, hemoglobin level, alkaline phosphatase level, etc., of groups of children alike in their stage of pubertal development but not necessarily of similar age. This consideration leads us to the final section of our paper on methodology in relation to growth measurements.

Use of Multivariate Analysis in Studying the Effect of More Than One Growth Factor

With the help of more elaborate statistical procedures than those previously mentioned, it is possible to apply independent tests of the significance of the effects of several correlated variables upon a given measurement. I am indebted to Dr. Ghosh for the statistical treatment of such a problem in multivariate analysis and I propose to present his results, which will be published elsewhere, in simple nonmathematical terms. As the result of a short longitudinal study, we had available for the sample of girls presented in Table 2 the following information: height increment for six and twelve months; the stage of maturity as determined by breast and pubic hair development; the levels of hemoglobin in the blood; and the levels of ascorbic acid, carotene, and alkaline phosphatase in the serum. For the purpose of analysis it was postulated that the height increment of each girl might be a function of (1) her stage of maturity, (2) the level of her serum alkaline phosphatase, and (3) the levels of one or more of the other three biochemical variables, hemoglobin, ascorbic acid, and carotene.* Dr. Ghosh's analysis shows that both the stage of sexual maturity and the level of the alkaline phosphatase of the serum are independently significant factors in accounting for the height increment of a given girl. With regard to hemoglobin level, the results were inconsistent since in one series of observations hemoglobin appeared to be independently significant as a prediction factor, while in another series of similar observations its effect was insignificant. In neither series were the levels of the other two biochemical variables, ascorbic acid and carotene, closely related to height increment. Thus, the analysis has permitted us to select from a number of variables included in a longitudinal study of

* The mathematical model actually used in the analysis equated the height increment of a given girl to the sum of the following terms: (a) a term for stage of sexual maturity, (b), (c), (d), and (e) four terms expressing the effects of levels of alkaline phosphatase, hemoglobin, ascorbic acid, and carotene, and (f) a term for random error.

growth, those which are independently significant in relation to the measurement in question, namely height increment. It seems clear that further experimentation of this sort may contribute materially to our knowledge of the factors which condition growth in childhood.

Summary

Nutriture is one of many factors which determine the growth of children. If we wish to draw an inference regarding nutriture from measurements of growth we must carefully consider the possible role of other growth determinants which might affect our results.

Analysis of covariance provides a useful tool for comparing and contrasting the mean growth measurements of groups of children. By its use we are provided with unbiased estimates of adjusted group mean measurements which are directly comparable, and we also obtain an efficient test of the significance of differences between groups.

Since sexual maturation is associated with first an acceleration and later a deceleration in growth, methods for determining group mean levels of maturity are required. Observations of the somatic changes which accompany puberty in boys and girls can be treated by the statistical technics of bioassay to yield the desired information.

Finally, by the use of more elaborate statistical methods involving multivariate analysis, it is possible to study the individual effects of several variables which may have contributed to the result observed. In this way a more discriminating analysis of growth phenomena is possible.

Appendix

Collection of Growth Data

Stature—This can be most accurately determined by posturing the child against a wall or plane surface and utilizing a convenient measuring device such as an anthropometer or Broca plane. For reliable results it is necessary to reposture and remeasure the child until the observations are consistent. Since diurnal variations in stature have been found, children should be measured at approximately the same time of day.

Weight—Besides the question of the accuracy of the scales, there is always the possibility that the weight of clothing may vary and that the child may have recently had a large intake of fluid or may have a full bladder. Especially when repeated measurements are made for the purpose of determining weight increments, these vagaries should be controlled as far as possible.

Age—In most cases, and especially with older children, the child's statement of his age and birthday may be trusted, and in our experience may be more reliable than the school card. The last court of reference, of course, is the birth certificate. Unfortunately, there are some groups in which all of these methods of ascertainment yield indifferent results. When covariance is used with age as an independent variable, the child's age in months at the time of observation is calculated from his birth date.

Observer error—All who have studied growth data are familiar with the occasional measurement, recorded in error, which is not consistent with other observations on the same child. A more subtle difficulty is the fact, which can be shown by suitable statistical technic, that there may be variations in the consistency of measurement within and between observers. For the most accurate work, these differences should be evaluated in order that a plan may be devised to reduce any bias in the observations.

Variables which may be avoided—Diurnal differences in stature and variations in body weight due to fluid intake and clothing have already been mentioned. There is also the problem of seasonal variations in growth rates which is discussed in another paper.[7] Whenever possible groups of children to be compared should be measured in the same season of the same year. A more difficult matter is the question of whether or not to exclude a child whose growth appears to be abnormal. Exclusion is probably justified in cases of definite pathology—dwarfs, orthopedic problems which obviously affect growth, etc. The question of whether or not to

exclude children with simple but marked obesity taxes the observer's conscience, since their inclusion distorts the variability, especially of small samples. The author includes all obese children unless there is definite evidence of abnormality.

Sampling procedure—This consideration is added for the sake of completeness and space does not permit an adequate treatment. A general statement may be made that each time a sample is drawn the investigator should have a clear idea of the exact nature of the population he is sampling, in order that he may properly interpret his results. Bias in selecting the sample should be avoided and, in addition, the numerous factors which generated the population under study should be carefully evaluated.

REFERENCES

1. Corry Mann, H. C. Diets for Boys During School Age. Medical Research Council, Special Reports Series No. 105, London, England, 1926.
2. Orr, J. B. Milk Consumption and the Growth of School Children. Lancet 1:202, 1928.
3. Leighton, G., and Clark, M. L. Milk Consumption and the Growth of School Children. Ibid. 1:40, 1929.
4. Orr, J. B., and Clark, M. L. A Dietary Survey of 607 Families in 7 Cities and Towns in Scotland. Ibid. 2:594, 1930.
5. Bryan, A. H., and Greenberg, B. G. Methods for Studying the Influence of Socio-Economic Factors in the Growth of School Children—Body Measurements. J. Elisha Mitchell Sc. Soc. 65:311, 1949.
6. Greenberg, B. G., and Bryan, A. H. Methodology in the Study of Physical Measurements of School Children. Part I. Human Biol. 23:160, 1951.
7. Bryan, A. H., and Greenberg, B. G. The Growth of Children from Different Social Environments. In preparation.
8. Greenberg, B. G. The Use of Analysis of Covariance and Balancing in Analytical Surveys. A.J.P.H. 43: 692, 1953.
9. Hogben, H.; Waterhouse, J. A. H.; and Hogben, L. Studies on Puberty. Part I. Brit. J. Social Med. 2:29, 1948.
10. Bryan, A. H., and Greenberg, B. G. Methodology in the Study of Physical Measurements of School Children. Part II. Sexual Maturation—Determination of Immaturity Points. Human Biol. 24:117, 1952.

Polio Gamma Globulin Distribution Procedures

The following procedures governing the distribution of gamma globulin, which have been transmitted to the Public Health Service by the Office of Defense Mobilization, have been sent to all state and territorial health officers:

1. Forty-five per cent of the supply of gamma globulin available for the prophylaxis of poliomyelitis will be set aside for the states and territories in accordance with each state's proportionate share of the national aggregate number of reported poliomyelitis cases during the five-year period from 1949–1953.

2. Forty-five per cent of the supply of gamma globulin available for the prophylaxis of poliomyelitis will be set aside for the states and territories in accordance with each state's proportionate share of the total population (1950) under age 15 in counties which had annual crude poliomyelitis attack rates (based on 20 or more cases) at least four times the national poliomyelitis crude attack rate during any of the years from 1949–1953. The population of a county will be included in this computation for each instance of such experience during the five-year period. Adjustments will be made for those areas participating in the vaccine field trial.

3. Ten per cent of the supply of gamma globulin available for the prophylaxis of poliomyelitis will be held as a contingency reserve.

In each case issuance to a state or territory will be made upon request of the state or territorial health officer. Poliomyelitis gamma globulin is being kept separately and issued separately from the gamma globulin for the prophylaxis of measles and infectious hepatitis.

Adapting Training Programs to the Needs of Individual Countries

ANDROMACHE SISMANIDIS, M.P.H., F.A.P.H.A.

Are the functional bases of our public health program exportable commodities? Only as they can be adapted to the conditions and needs of the importing country or region, is the answer of this international worker.

✢ It has been recognized for many years that one of the great obstacles in the development of nutrition programs, particularly in the underdeveloped countries [1] where the need for such work is most acute, is the inadequacy and oftentimes the complete lack of nutrition personnel. International organizations—the World Health Organization and the Food and Agriculture Organization of the United Nations—whose concern is the improvement of levels of health and nutrition have stressed the importance of and the need for training in this field. Their activities in this respect include the provision of fellowships, training courses, seminars, workshops, and other training arrangements. Training of nutritionists from other countries has for many years been included in the programs of foundations and organizations concerned with health, agriculture, and education. The training of technical personnel, including nutrition personnel, has gained much impetus through the Technical Assistance Programs of the United Nations and the specialized agencies, the bilateral aid programs of the United States, and the technical assistance programs which a number of countries have recently embarked upon. Countries throughout the world realize the importance to social and economic development of having and sharing the know-how. They also realize more and more the place of nutrition in economic and social betterment and are interested in training nutrition personnel to carry out programs for the improvement of the nutritional levels of their populations.

On the other hand, those who are at the training end have no doubt felt the impact of this emphasis given to training. According to a report of the Institute of International Education,[2] over 33,000 individuals from abroad were enrolled in the educational institutions of the United States in 1952–1953. They came from 128 countries and territories. This figure of over 33,000 does not include the individuals who might have come for training and observation, and for whom enrollment at an educational institution was not required. It is difficult to arrive at exact figures on the total numbers studying nutrition. However, since the United States is the leader the world over in this field, the number is no doubt high.

The United States can be considered in a strategic position in the training of nutritionists and as a result of this in the shaping of nutrition work in the

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world. However, this does present some difficulties, for the United States is a highly developed country and it is not always possible to orient the training in the United States to the type of problems found in the less developed regions. The specialized agencies of the United Nations are putting emphasis on training on a regional basis. Training courses are arranged for countries or regions with somewhat similar problems and situations. A few examples are the School Feeding Seminar for Central America and Panama given in San Jose, Costa Rica, the Nutrition Training Course for the Near East given in Cairo, Egypt, that for the Far East given in Calcutta, India, and that for the French-speaking African countries given in Marseille, France.

Those of us who are concerned with training programs have no doubt enjoyed the foreign students and visitors and have been stimulated and challenged by their problems, though at times one feels the strain and even frustration in trying to meet their needs. Their problems are oftentimes very different from ours. They come from different environments, cultures, and economies. Their political setups, their administrative machinery, and their educational systems are completely different. This difficulty of understanding goes both ways—it affects both the trainers and the trainees.

The many specialities for which training in nutrition is given, as well as the various levels of training, cannot be treated separately or in detail at this time. Of necessity, this must be covered in general terms. Perhaps it would be well in considering the factors in the training of foreign students in nutrition to try to visualize the position of a nutritionist in his own country, the problems he faces, the facilities at his disposal, and the ways in which the problems can be attacked.

If training programs are to prepare individuals for effective and fruitful work on return to their homelands, it is essential that these programs be adapted to the needs of these countries. There is nothing so frustrating to an individual as to find, after spending much time in becoming highly trained and specialized, that he cannot do very much with his training in his own country; or that there are no positions available for his speciality; or that his country is unable economically to launch the type of program for which he trained. A program which seems to run smoothly in the United States cannot necessarily be transplanted to another country. It must be adapted to the local situation. There are many factors which make possible the healthy existence and growth of such a program in the United States. The nutrition work done by the community nutritionist or the home demonstration agent are examples. These programs cannot go on by themselves. They are dependent on a number of other programs—the research program from which they can get ideas and facts and to which they can feed the problems that must be solved by research—the educational institutions from which they can be assured of a source of nutrition personnel, as well as other factors that do not exist in other countries. A seed that grows well in one country may not do so well in another with a different climate and soil. The transition from a highly developed country to an underdeveloped one is a difficult one for most students, as it is for most nutritionists. It is here where help is needed by the student. This transition requires vision and imagination. It requires maturity and the ability to evaluate. Above all, it requires a bit of the pioneer spirit.

If the training program is to be adapted to the needs of a country, background information about the country is required. Unfortunately, this informa-

tion is not always available from the student, particularly if he has had no work experience in nutrition in his country or does not know his country's problems. In addition, the literature may be very limited or in a language we do not know. Background information on the levels of living in both urban and rural areas, the agricultural and industrial development, the social and cultural factors, the educational levels and facilities, and the labor situation all help to point out the type of training necessary.

Other factors, such as the existence of educational institutions for training in nutrition, the supply of nutrition personnel and other professional workers closely related to nutrition, the professional status of nutritionists and their salary levels in comparison to other professional personnel, and the existence of research, education and action programs have a direct bearing on training programs, as well as on the effectiveness of the work to be done by the trainee on his return.

A few examples might help bring out the importance of these factors. Diet for children in the postweaning age is one example. In the Western countries the postweaning diet is built around milk. Our teaching on this is tuned to our milk supply to a great extent. In some countries, however, the agricultural pattern is different. Milk supplies are inadequate and the development of the milk industry is not likely for many years to come. There are many countries where the milk supply can provide on the average less than one-fourth cup of milk per person per day. The Western pattern of the postweaning diet would be impossible, if not impractical, in these countries. However, there may be other foods of high nutritional value which are grown locally and which could provide, in combination with other foods, a satisfactory diet—though different from the Western pattern. In FAO intensive work is being done on the use of local foods, such as fish flour, dry soya milk powder, etc. Information on the agriculture and food supply of the country would be most helpful in such a situation in preparing the student for effective work in his country.

Another example is that of an individual who on return to his country is to be the only adequately trained nutritionist. His job would require him to have a general and broad background and training in nutrition. Later on, there may be need for more specialized personnel, but in the initial stages of development of a nutrition program a person specialized in a narrow field of nutrition cannot carry out as effective a program as one who has a more general background. In such a case, helping the student find the groups or agencies which can help him both in regard to data and in implementing programs is important. The agencies that can provide such information are not always the same as in our country. For example, in one country in which I worked some of the data available on cost of living were obtained from the national bank and one of the newspapers; whereas in another country such data were available from the Central Statistical Office. In another country, the pharmacology department of the university under which nutrition was taught had most of the data available on the nutrition of the population.

In helping the trainee it is important to know what type of work he is to do on return and also the setup in which he is to fit. If the individual is to be used to full advantage, he must be integrated into the national nutrition program. Unfortunately, many students do not know what they are to do and are not familiar with the programs existing in their countries. However, much could be done in getting such information.

The experience of many organizations that are concerned with the training

of foreign students has led them to emphasize the importance of training for a particular job to which the individual is to return. The organization that I represent has a policy regarding fellowships which emphasizes this point. Fellowships are granted only in conjunction with technical assistance assignments to which an expert, at the request of the government, has been assigned to the country to develop an area of work. The expert sent to the country helps the government choose the individuals who are to be given training abroad. The expert also advises on the type of training needed for the person and the job to which he is to be assigned upon return and usually the country and institution where the training could best be given.

In regard to the training program, there are a few points that need emphasizing. First are the basic courses. A good grounding in nutrition is necessary, because many of these trainees will go to positions in which supervision by a senior or well trained nutritionist is not always possible. The trainee in many cases will have to start alone. Refresher courses, workshops, conferences, inservice training, literature, books, and periodicals are not always available. In addition, these workers will oftentimes not have the opportunities of discussion and exchange of ideas with other workers, and from experience, I can say it is a terrible feeling to be the only nutritionist in a country. The criteria for training should be based on general principles. To insist that foreign students fit into the standard curriculum of the United States institutions is not only impossible, but in many cases undesirable. The courses must be planned to meet their needs, and it may be necessary to arrange for the student to take some of the elementary basic courses to supplement his other training and to prepare him for more advanced work.

Throughout the training, emphasis should be given to methods of evaluation and approach to the problems existing in the country of the student and ways of solving them. For example, country "A" has no research going on in nutrition, there are no training facilities, and the total nutrition personnel will consist of two people. How and where do these two workers start? What type of personnel could assist them? How can auxiliary workers be used, and how much can be expected of them? What is the place of nutrition in the educational setup? The question of postweaning diets referred to previously is another example.

Then there is the question of observation and field visits. This should be adapted to the needs of the individual with due consideration being given to the type of position for which the individual is being trained and his level in the national setup. Senior officials and policy-makers can benefit a great deal from over-all observation of programs. They know their country's problems and are experienced enough to judge programs which could be adapted to their situation. Undergraduates and junior workers can profit from some types of observation, although their greatest need is subject matter.

Another consideration is that of combining certain aspects of agriculture and health for nutrition training of foreign students. Underdeveloped countries are mostly agricultural. Usually, nutrition is attached to one ministry such as health or agriculture. In order that a nutritionist in these countries may do an effective job, it is important that he have an understanding and be aware of the implications of both health and agriculture in improving levels of nutrition. In the early 1930's, when nutrition was put on the agenda of the League of Nations, there was a heated debate about the place of nutri-

tion. It was at this time that Lord Bruce of Australia made his famous statement—"The marriage of health and agriculture." This motto has not been lost sight of in the World Health Organization and the Food and Agriculture Organization. FAO's interest in nutrition is from the point of view of the production, distribution, and consumption of food; WHO is concerned with nutrition from the point of view of the maintenance of health and the prevention of disease; and yet in the field of nutrition these two agencies—one agricultural and the other health—work closely together. A joint FAO/WHO Expert Committee on Nutrition [3] meets regularly to advise on the nutrition programs of the two agencies. Since it is difficult to have a clear dividing line in nutrition, much of the planning and the work in nutrition is and must be done jointly. Agriculture should not plan without giving consideration to health needs and neither can health improve nutrition without help from agriculture.

A good example in this respect is kwashiorkor, the nutritional deficiency disease affecting children in the post-weaning ages due to inadequacy of good quality protein. This serious and widespread nutritional deficiency disease [4] needs an attack from both the health and agricultural sides if the results are to be effective. WHO and FAO are working together on this problem. The treatment of the disease is a health department problem, but if this deficiency disease is to be eradicated it will be necessary to have available for the population protein of good quality and adequate quantity. This requires a long-term approach, a change in the agricultural pattern of the country, as well as an educational program. Both health and agriculture have a part to play in wiping out this nutritional deficiency disease.

REFERENCES

1. Joint FAO/WHO Expert Committee on Nutrition, Report on the Second Session. Food and Agriculture Organization, Rome, Italy (Nov.), 1951.
2. Education for One World. New York: Institute of International Education, 1951.
3. Joint FAO/WHO Expert Committee on Nutrition, Report of the First Session. Technical Report No. 16. Geneva, Switzerland: World Health Organization, 1950.
4. Brock, J. F., and Autret, M. Kwashiorkor in Africa. FAO Nutritional Studies No. 8. Rome, Italy (Mar.), 1952.

Preventing Slums in Baltimore

The Baltimore City Health Department, through its commissioner of health, Huntington Williams, M.D., has recently promulgated amended rules and regulations governing the hygiene of housing and of rooming and lodging houses and hotels. The 1954 revised regulations are designed to head off housing blight as well as to effect remedies in slum level situations. They are intended to correct such conditions as multiple family use of a single bathroom, lack of hot water and adequate washing facilities, shared kitchens, and crowded, ill-ventilated bedrooms, conditions that turn fine neighborhoods into slums.

The provisions for separate bathtub or shower facilities with both hot and cold water do not take effect until 1956, thus giving opportunity for orderly readjustment.

In transmitting the regulations to the mayor, Dr. Williams, said, "The time has come for more positive action in the prevention of blight and slums, as equally important as a health measure as the curative nuisance abatement activity in this field during the past 15 years." In this transmittal also Dr. Williams paid tribute to the consultant advice of Professor C.-E. A. Winslow and the staff of the Committee on the Hygiene of Housing of the American Public Health Association.

Deficiencies in Our Training of Foreign Public Health Students

MYRON E. WEGMAN, M.D., F.A.P.H.A.

A discussion of the difficulties of providing useful education for "foreign" students has something to suggest to institutions offering training courses to candidates from distant communities in the home country. Accepted solutions for one area's problems often will not work in another.

✢ From the international standpoint, this title is perhaps incongruous, as "our" perforce, includes all countries. There is, however, a definite moral to be drawn from the generalization; difficulties probably occur in any country for students coming from outside its own borders. In this sense the problem is a universal one but, under the circumstances of the present discussion, the frame of reference will be limited to the United States.

The recently completed report of the second meeting of the World Health Organization Expert Committee on Professional and Technical Education called attention to an old truism, "all education is self-education." Even on an international scale students need mainly an opportunity to complete self-education through provision of contact with teachers and situations from which they can profit. Obviously, this requires an adequate level of competence and capability on the part of the student, which means careful selection. This is a particular necessity for "foreign" study. Many of the complaints about difficulties with foreign students, and this is true in all countries, are due to poor selection. In addition to intellectual ability, a student selected for international study must have the adaptability and capacity to draw elastic rather then rigid implications from his experiences. In other words, he must be able to perceive the way an experience could be applied within the local conditions of his own country and not think that he must duplicate or reproduce exactly in his own country what he has seen abroad. He must be able to take an active part in his study-country without constantly complaining of difficulties because of different conditions. Obviously, he must be able to work in the language of the country of study. In this respect there has been great room for improvement, but some progress recently can be reported.

Selection in regard to ability is no simple task. There is often bitter complaint of the fact that some fellowship applications are "political," often meaning that someone's relative is being given a chance, with the connotation that such a student is inadequate. As Dr. Brock Chisholm, first director-general of the World Health Organization, pointed out recently in an address, the pattern of nepotism, which is self-righteously decried in the United States, is in some countries of the world the accepted pattern of behavior. The man who does not look after his relatives once he has reached high office is looked down upon with considerable disfavor and is not acting in moral fashion. Our task, perhaps, is not to complain about customs and mores with which we are

not familiar, but to insist only that persons selected be able enough to benefit from training.

To supplement what has been said about high standards for students who go to foreign countries for study, it is equally important to set high standards for teachers who will handle foreign students. A high degree of understanding and sympathy is required, as well as flexibility in interpreting unfamiliar situations. Clarity and distinctness of expression, both verbal and written, are vital. Keeping in mind the fundamental importance of selection, I should like to discuss the "difficulties" under three main headings: (1) content of instruction to be given, (2) modes of communication between teacher and student, and (3) evaluation of work performed. With regard to content, there is a certain core of basic information which is universally applicable as scientific background for the disciplines of public health. There is in addition, however, a good deal of particular information adaptable only to the individual situation. This is perhaps just as true of the man who goes from one community to another in the same country as for the man who goes from one country to another. There are certain similarities, but there are also great dissimilarities often based on the personalities of the people in positions of importance. When it comes to country differences, of course, there are problems of cultural connotations. Some of the accepted solutions in one country just do not work in another. The fundamental character of environmental sanitation is widely accepted as the basis for a sound public health program. Nevertheless, experience in many spots around the world indicates that the most elaborate and well designed environmental sanitation installations will have little or no effect until the people of the community understand what it is about and really want the improvements which experts may, in their omniscience, be sure are needed. It is probably even more important with foreign students than with native students that more attention be given to the sociological aspects of public health and that this be done not merely as a separate course. It is urgent that sociologists be encouraged to develop technics which will help this influence to be brought to bear on all the practical training courses in the public health curriculum.

In Latin America, where there is a keen interest in sociology as well as in social structure, there are great opportunities for developing this kind of relationship in instruction. Though many orthodox public health workers are chary of introducing new elements into the curriculum, when so much improvement can be accomplished with the traditional content, nevertheless, sociological aspects are so fundamental to community improvement that they are particularly needed in international instruction.

There has been much criticism over bringing students from underdeveloped countries, so-called, to highly developed countries, also so-called. A public health audience is well aware that these terms are relative. Some underdeveloped countries have cultures far ahead of the more technically developed countries. Sometimes the student from the technically underdeveloped country resents what he sees in the way of technical advancement in the more highly complex situation and just throws up his hands as to the possibility of drawing any lessons for use at home. That

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this situation is not unique to the United States is illustrated by something which happened to me within the past few months. I had made a visit to one of the excellent schools of public health in Latin America and was struck by the fact that one of the students, a "foreigner," criticized the school because it was too much adapted to the country in which it was located. After some discussion he agreed that this was proper and that perhaps he was the one who needed to do the integration in his own thinking. When I returned to our office, however, and reported this fact at a staff meeting, one of my more experienced colleagues remarked wryly, "It is a distinct advance to hear they are complaining that the school is too local. Up to a few years ago, that school was too much Johns Hopkins!"

Statements are made glibly of the need for giving practical experience to both foreign and native students. The need for practical training is obvious, but such training is difficult to plan. There is much to learn before it may be said that practical work or observation has been made a true learning experience. Critical evaluation of what the student sees and does is time-consuming, but essential.

One of the most important aspects of the content of public health instruction, and one which has received much more attention in recent years, is the management of interpersonal relations. This is the problem of man's understanding of man and of the ways people work together. Again, there is groping, for the problem is obvious and there is a tendency, after first recognizing the deficiencies, to jump to conclusions as to what the solutions may be. It was a fortunate circumstance that the first director-general of the World Health Organization happened to be a psychiatrist. Control of communicable disease and improvement in environmental sanitation are still the bases of a public health program, but emotional and personality aspects have influenced the kind of thinking needed to learn to work with people to achieve these ends. This becomes all the more important as a part of the experience of the student chosen for international study. It is a difficult enough concept to get across to "native" students; how much more difficult it is for "foreign" students.

The problem of communication will be touched upon only briefly. Even the foreign student who is relatively fluent in the language of the country of study still has a difficult task in covering the same amount of ground as rapidly as the "natives" do. This puts upon the teacher the necessity for choosing wisely the kind of reading that he expects his students to do. Specific reading assignments and page references may result in a kind of spoon-feeding which has no place in graduate study. At the same time, it is clear that the wise teacher must help his foreign students to avoid becoming bogged down in long papers which will be of relatively less significance and use.

Teachers, generally, are very much interested in the question of visual aids. Certainly, use of motion picture, film strips, illustrated charts, and similar materials holds great promise for international work. This lesson has been brought out clearly at the various international medical congresses in recent years. The formal lectures and conferences were actually far less interesting than the exhibits which were brought together from all over the world. The charts and the figures surmounted much of the obstacle of language difficulty and one could not help but be impressed with the enormous amount of valuable work going on everywhere in the world. Again, there is much to learn in the proper uses of these media.

Evaluation of foreign student accomplishment presents difficulties. What standards shall we adopt? In view of

the handicaps under which any foreign student labors, should we lower standards to give him a degree because he is having a harder time? The teaching profession answers this with a resounding "no." Lowering the standards cheapens the degrees for all. Should we give a compensatory "lower" degree for those who fail in achieving the regular degree? Again, the answer is not easy. Even the foreign student who has undergone great difficulty and privation to come to another country for study must, if he cannot accomplish the minimum amount of work necessary for a degree of recognition, face the fact that he has not earned the degree. Most universities are quite willing to give the student a certificate of attendance, an attestation of his industry and interest. In almost every case this represents acquisition of a substantial amount of knowledge which cannot help but improve the student's contribution to the health service of his own country on his return. It would seem that this might well be considered a reasonable, if not wholly satisfactory, return for the investment in the fellowship. If this were generally understood, the degree would have more meaning.

A corollary question is to whom information on the student's program should be given. Both the agency that paid for the fellowship and the government which is going to employ the student on his return will want to know how he has done. Reports need to be given accurately, honestly, but circumspectly, with true realization of the dangers of indiscriminate reporting.

In conclusion, it bears re-emphasis that a constant attitude of self-criticism in the handling of foreign students and realization of the shortcomings of our knowledge of methodology ought to help us to overcome the difficulties as they appear. The problems can be thought of in terms of content, of methods of communication, and of evaluation. All of the problems exist for native students, as well as for foreign. The foreign element is an additional complication which should be weighed carefully at every stage of the teaching.

Colorado Studies Chronically Ill

The Colorado Department of Public Health has received from the W. K. Kellogg Foundation a three-year grant to study programs for the chronically ill, aged, and aged sick. The avowed purpose of the study is "to awaken community interest and responsibility." The terms of the grant provide for research to demonstrate ways and means of achieving coordinated programs for services and facilities for the chronically ill at community levels. The earliest phase of the study is a survey of four different communities for possible pilot programs. Director of the program is Ruth B. Howard, M.D., former director of maternal and child health of the department.

Immune Responses to Diphtheria, Tetanus, and Pertussis, Aluminum Phosphate Adsorbed

LOUIS W. SAUER, Ph.D., M.D., F.A.P.H.A., and WINSTON H. TUCKER, Ph.D., M.D., F.A.P.H.A.

Reported here is a successful experience with a modified DTP antigen.

✣ Immunization procedures against diphtheria, tetanus, and pertussis have recently experienced two far-reaching modifications. One was the result of a directive from Workman,[1] chief of the Laboratory of Biologics Control, National Microbiological Institute of the National Institutes of Health, requesting "discontinuance of the use of human blood or its unsterilized fractions in medium for the cultivation of H. pertussis to be used in pertussis vaccine." This precautionary measure was prompted by the recent increase in the incidence of reported cases of infectious and serum hepatitis. The other departure resulted from a field study by McComb and Trafton,[2] the report entitled "Immune Responses and Reactions to Diphtheria and Tetanus Toxoids, with Pertussis Vaccine, Aluminum Phosphate Precipitated." Their triple antigen (DTP) was standardized to contain 20,000 millions of killed bacilli per ml. grown in Cohen-Wheeler liquid medium without blood. Three 0.5 ml. doses were administered at four-week intervals to children over six months of age. Reactions were almost completely absent—erythema and infiltration were infrequent—one alum cyst occurred in a total of 765 injections.* Blood from 71 children was examined one month after the third dose. One hundred per cent showed immunity against diphtheria (0.1 unit per ml.) and tetanus (0.03 unit per ml.). In 75 per cent the pertussis agglutination titer was 1:320 or better.

These two events in the field of pediatric immunization with triple antigen (DTP) prompted the study reported here. A total of 213 infants were injected with four monthly doses of a triple antigen (DTP), prepared for us for investigational use by Parke, Davis and Company of Detroit. It was composed of highly purified diphtheria and tetanus toxoids adsorbed on aluminum phosphate in standardized proportions, combined with pertussis vaccine prepared from Hemophilus pertussis grown in a fluid medium without blood. It contained 30,000 millions of killed pertussis bacilli per ml. The first of the four monthly doses was given when the infant was three months old. It was injected into the left lateral proximal gluteal area, the administration technic being that used in previous studies.[3, 4] Each infant received an adequate immunizing dosage of diphtheria and tetanus toxoids and the equivalent of 60,000 millions of H. pertussis. One

* Their questionnaire, sent to Massachusetts physicians in 1953, was answered by 88 per cent; 96 per cent were using it and of them 78 per cent reported "no reactions."

month after the fourth dose blood was drawn for diphtheria and tetanus antitoxin and pertussis agglutination tests.

The objectives of this study were to determine:

1. The severity of febrile and local reactions, compared with reactions observed by us in a previous study [2] in which four monthly doses (0.5 ml.) triple antigen (DTP) alum precipitated of the same concentration were administered to similar groups of infants of the same age.

2. The diphtheria and tetanus antitoxin levels and the pertussis agglutination responses one month after four monthly 0.5 ml. doses of a new triple antigen (DTP)—diphtheria and tetanus toxoids, pertussis vaccine, aluminum phosphate adsorbed, starting at the age of three months.

Procedure Followed

The 213 infants were injected with four monthly doses of 0.5 ml. of the following triple antigen (DTP):

No. X-0133
Diphtheria toxoid, aluminum phosphate adsorbed
Tetanus toxoid, aluminum phosphate adsorbed
Pertussis vaccine, 30,000 millions per ml.

The antigen in 7.5 ml. vials was flown from the Parke, Davis Research Laboratory in Detroit to the Whooping Cough Research Laboratory at the Evanston Hospital where it was kept refrigerated. On the day prior to a clinic the required number of vials, transferred to a chilled thermos food jar, were kept refrigerated until used at the clinic. Each vial was well shaken before the first dose was aspirated. Of the total 213 infants, 132 are Evanston Infant Welfare children attending the Evanston Health Department Immunization Clinic; the remaining 81 infants are orphans at the St. Vincent Infant and Maternity Hospital which is located in a congested area of Chicago.

Preliminary determinations of the immune status were not made because in a previous study a small series of preliminary determinations showed immunity to be negligible in infants of approximately this age. The four monthly doses of 0.5 ml. each were administered into alternate lateral gluteal areas, starting with the left proximal. Blood was drawn one month after the final dose. Tests for diphtheria and tetanus antitoxin levels were performed on batches of the serum flown to the Parke, Davis Research Laboratory the day after withdrawal. The technic used in a previous report [3] was followed. Pertussis agglutination tests were performed at the Whooping Cough Research Laboratory on the day following withdrawal according to methods previously outlined.[3] Schick tests were performed on the left forearm according to the standard technic. To exclude false-positives, readings were made five days later. The results of the tests are shown in the tables to follow.

Reactions

At the immunization clinic at the time of the first dose each mother was instructed to keep the injected infant more quiet; if restless or feverish, to give an adequate dose or two of aspirin, to offer water repeatedly, to reduce a feeding or two, and on hot days to avoid excessive covers and sun. At the time of the second injection she was questioned about reactions. At St. Vincent's the nurses and pediatric resident were told to report any severe febrile or local reaction at the following session. In

Dr. Sauer is associate professor of pediatrics, emeritus, Northwestern University Medical School, Chicago, and Dr. Tucker is commissioner of health, Evanston, Ill. This study was made possible by an annual grant from Parke, Davis and Company, Detroit, Mich., who also provided all of the biological preparations. This paper was presented before the Laboratory Section of the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 12, 1953.

Table 1—Diphtheria Antitoxin Response (Following Four Primary Injections of DTP, Aluminum Phosphate Adsorbed)

	Number of Infants	Schick Test Negative	Titration Level (1 Month After Fourth Dose 0.1 or More Unit per ml.)	Per cent
Evanston Health Department (Free-living)	132	132	132	100
St. Vincent (Orphanage)	81	81	81	100
Total	213	213	213	100

neither group was a febrile reaction reported that lasted longer than two days. Hyperpyrexia, convulsions, or discharging cyst did not follow any of the 852 injections. In the Evanston group two instances of an unusually large area of erythema and induration at the injection site were reported within a few days. The continuous application of thick gauze pads saturated with aluminum subacetate solution (1:20) effected prompt improvement without any trace of cyst formation. Evanston nurses and mothers and St. Vincent's nurses were emphatic in their convictions that systemic and local reactions were less frequent and much milder than in previous studies when four monthly doses of 0.5 ml. of a triple antigen (DTP alum precipitated) of the same concentration were administered to 163 infants in the same dosage, at the same ages, using an identical technic. None of the 852 doses in the phosphate series was followed by a sterile cyst; two of the 652 doses in the alum precipitated series terminated in cysts.

Table 2—Tetanus Antitoxin Response (Following Four Primary Injections of DTP, Aluminum Phosphate Adsorbed)

	Number of Infants	Titration Level (1 Month After Fourth Dose 0.1 or More Units per ml.)	Per cent
Evanston Health Department (Free-living)	132	132	100
St. Vincent (Orphanage)	81	81	100
Total	213	213	100

Table 3—Pertussis Antigenic Response (Following Four Primary Injections of DTP, Aluminum Phosphate Adsorbed)

	Number of Infants	Agglutination Test		Per cent Positive (1:320 or More)
		Less than 1:320	1:320 or More	
Evanston Health Department (Free-living)	132	15	117	88.6
St. Vincent (Orphanage)	81	6	75	92.5
Total	213	21	192	90.1

Determinations of Diphtheria Antitoxin Levels in Infants Who Had Received Four Monthly Injections of Triple Antigen (DTP, Aluminum Phosphate Adsorbed)

Table 1 shows the Schick test results and diphtheria antitoxin levels found in the sera of the 213 infants one month after the fourth intramuscular dose of 0.5 ml. of triple antigen (DTP, aluminum phosphate adsorbed). In 100 per cent of the infants, the Schick tests are negative and the diphtheria antitoxin level of 0.1 or more of a unit per ml. of blood serum are found. In 8.7 per cent of the infants the level is between 0.1+ and 1.—; in 65.1 per cent, the level is between 1.+ and 10.; in 26 per cent, the level is 10.+ or more.

Determinations of Tetanus Antitoxin Levels in Infants Who Had Received Four Monthly Injections of DTP Aluminum Phosphate Adsorbed (Triple Antigen)

Table 2 shows the tetanus antitoxin levels found in the sera of the 213 infants one month after the fourth intramuscular dose 0.5 ml. of triple antigen (DTP, aluminum phosphate adsorbed). In 100 per cent of the infants a tetanus antitoxin level of 0.1 or more of a unit per ml. of blood serum is found. In 2.6 per cent, the level is between 0.1+ and 1.—; in 61.3 per cent, the level is between 1.+ and 10.—; in 36.1 per cent, the level is 10.+.

Determinations of Pertussis Agglutination Levels in Infants Who Had Received Four Monthly Injections of DTP, Aluminum Phosphate Adsorbed (Triple Antigen)

Table 3 shows that one month after the fourth monthly dose, an agglutination titer of 1.320 or better is attained by 88.6 per cent of the 132 welfare infants and by 92.5 per cent of the 81 St. Vincent's Orphanage infants. This gives an average total of 90.1 per cent showing adequate immunity. In 9.9 per cent, the agglutination titer was less than 1:320. The pattern is almost as high as for diphtheria and tetanus.

Conclusions

1. As a primary immunization, four monthly doses (0.5 ml.) of a new triple antigen (diphtheria, tetanus, and pertussis, aluminum phosphate adsorbed) were well tolerated when administered to 213 infants at three, four, five, and six months.

2. Febrile and local reactions were observed less often and were milder than the reactions observed in a previous study in which 163 infants were similarly injected with four monthly doses of a triple antigen (diphtheria, tetanus, and pertussis, alum-precipitated). No sterile cyst followed the 852 doses of the phosphate series; whereas two discharging cysts occurred in 652 doses of the alum-precipitate series.

3. In immunity tests performed on the 213

sera, one month after the fourth dose, protective levels of antitoxins for diphtheria and tetanus and negative Schick tests were found in 100 per cent of the infants; pertussis agglutination titers of 1:320 or more were found in 90.1 per cent.

ACKNOWLEDGMENT—We wish to acknowledge the technical assistance and untiring efforts of Eva Markley in performing the agglutination tests and compiling the records. We also express our gratitude to Dr. Anna Kalnins who was helpful in drawing some of the bloods.

REFERENCES

1. Workman, W. G. Laboratory of Biologics Control, National Microbiological Institute, Federal Security Agency, National Institutes of Health, Bethesda, Md., June 5, 1951.
2. McComb, J. A., and Trafton, M. Z. Immune Responses and Reactions to Diphtheria and Tetanus Toxoids with Pertussis Vaccine Aluminum Phosphate Precipitated. New England J. Med. 243:442-444 (Sept. 21), 1950.
3. Sauer, L. W., and Tucker, W. H. Simultaneous Immunization of Young Children Against Diphtheria, Tetanus, and Pertussis. A.J.P.H. 40:681-685 (June), 1950.
4. Sauer, L. W. Precautions in Pediatric Immunization Procedures. J.A.M.A. 152:1314-1317 (Aug. 1), 1953.

National Health Council Meets

The 34th annual meeting of the National Health Council was held in New York City, March 24–26. The first two days were devoted to a forum on "Changing Factors in Staffing America's Health Services." Attended by about 250 persons, the two days developed a wealth of material useful in the effort to meet increasing demands for health personnel. Proceedings in some form will later be made available.

William P. Shepard, M.D., vice-president of the Metropolitan Life Insurance Company and long-time chairman of the Committee on Professional Education, American Public Health Association, was chairman of the conference. Annual dinner speaker was Franklin D. Murphy, M.D., chancellor of the University of Kansas. Both he and Detlev W. Bronk, D.Sc., president of the Rockefeller Institute for Medical Research, who gave the opening stage setting address, made a plea for more research, more experimentation, more synthesis of the disparate specialties, and more citizen participation in the solving of the nation's health and health personnel problems.

At the business meeting of the council four new national agencies were admitted to active membership—the American Osteopathic Association, the Association for the Aid of Crippled Children, the Muscular Dystrophy Associations of America, and the United Cerebral Palsy Associations. The Planned Parenthood Federation, heretofore an associate member, was granted active membership. The council's membership now numbers an all time high of 48, of which 38 are active members.

Re-elected to office were:

President—A. W. Dent, president, Dillard University
Vice-President—Basil O'Connor, president, National Foundation for Infantile Paralysis
Secretary—Rome Betts, executive director, American Heart Association
Treasurer—Philip Mather, president, American Social Hygiene Association

Chosen for president-elect is T. Duckett Jones, M.D., medical director of the Helen Hay Whitney Foundation, New York Hospital. Two new vice-presidents were selected, Ira V. Hiscock, D.Sc., chairman, Department of Public Health, Yale University, and Hugh R. Leavell, M.D., professor of public health practice, Harvard School of Public Health and president of the American Public Health Association.

Public Health Aspects of the Development of Antibiotic-Resistant Staphylococci

AMEDEO BONDI, Ph.D.; FLORENCE PFAFF; ELIZABETH FREE; and ROBERT SWERLICK, M.D.

Many health workers, still active, will recall their student days in bacteriology when they were taught that staphylococci were morphologically interesting, but of medical importance chiefly as the producers of "boils and ulcers." This study points out, "that staphylococci are rapidly becoming the most important and most common cause of bacterial infection."

✣ A number of reports [1-4] have recently appeared in the medical literature describing the changing status of the sensitivity of staphylococci (Micrococcus pyogenes var. aureus and Micrococcus pyogenes var. albus) to the antibiotic agents. All these reports are in general agreement concerning the increasing incidence of strains of antibiotic-resistant staphyococci recoverable from hospitalized patients. It is apparent at the present time that half or more of all strains isolated in the laboratories of most large hospitals are independently resistant to penicillin, streptomycin, aureomycin (chlortetracycline), and terramycin (oxytetracycline). This paper summarizes a survey of the antibiotic resistance of 125 strains of staphylococci isolated in this laboratory. The results of the survey confirm the reports of others,[1-4] and are used by the authors to illustrate some of the public health aspects of the increased incidence of antibiotic-resistant staphylococci.

All the strains of staphylococci included in the study were isolated from clinical specimens taken from hospitalized patients. These strains were picked from the blood agar plates used for primary cultivation of the clinical specimen, to brain-heart agar slants, incubated and refrigerated until tested. Antibiotic-sensitivity tests were carried out by the serial twofold dilution method in broth and by the disk method.[5] Both tests were performed simultaneously on each strain so that the percentage of resistant strains determined by both methods could be correlated. Sensitvity to all of the more commonly used antibiotic agents was determined.

The criteria used in evaluating resistance are shown in Table 1. Table 2 revealing the percentage of resistant strains as determined by both methods, shows that the results are essentially the same by both methods. Two strains highly resistant to penicillin in the tube test showed zones of inhibition of 12 mm. and 13 mm. by the disk test characteristic of strains considered to be only moderately resistant but, with the exception of these two strains, both methods gave identical results. The

The authors are associated with the Department of Bacteriology, Hahnemann Medical College and Hospital, Philadelphia. This investigation was supported in part by research grants from the National Institutes of Health, Public Health Service, Bethesda, Md., and the Smith, Kline, and French Foundation of Philadelphia, Pa. This paper was presented before the Laboratory Section of the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 11, 1953.

Table 1—Criteria for Antibiotic Resistance

Antibiotic	Tube Test Inhibiting Concentration	Disk Method * Concentration	Disk Method * Zone Size mm.
Penicillin	> 2.5 μ/ml.	50 μ/ml.	< 11
Streptomycin	> 25.0 μg/ml.	500 μg/ml.	< 11
Chloromycetin	> 12.5 μg/ml.	500 μg/ml.	< 11
Aureomycin	> 6.25 μg/ml.	500 μg/ml.	< 11
Terramycin	> 6.25 μg/ml.	500 μg/ml.	< 11
Erythromycin	> 2.00 μg/ml.	100 μg/ml.	< 11
Magnamycin	> 5.00 μg/ml.	500 μg/ml.	< 11

* Wet method

number of strains resistant to each agent compares quite favorably with those of the other investigators. The high incidence of strains resistant to penicillin may be contrasted with the low incidence (14 per cent) reported in 1945.[6] Cross-resistance to aureomycin and terramycin was observed in each strain resistant to either agent. The present incidence (47 per cent of strains resistant to both agents) is contrasted with the negligible incidence (less than 5 per cent of such strains in 1949). The comparatively low incidence of cultures resistant to chloromycetin may be attributed to the decreased use of this agent, although recent studies[7] indicate the possibility that resistance to this agent may not be readily acquired. Although cultures of staphylococci resistant to erythromycin and magnamycin which show cross-resistance were not encountered in our survey, such resistant strains have recently been isolated in our laboratory now that both agents are being used therapeutically on a wider scale.

In Table 3 a correlation of antibiotic resistance patterns is shown. Each strain has been grouped according to its pattern of resistance and the incidence of strains in each group has been determined. It is significant that the

Table 2—Antibiotic Resistance of 125 Strains of Staphylococci

Antibiotic	Per cent Resistant Tube Test	Per cent Resistant Disk Method *
Penicillin	75.9	74.1
Streptomycin	45.1	45.1
Chloromycetin	5.7	5.7
Aureomycin	47.5	47.5
Terramycin	47.5	47.5
Erythromycin †	0	0
Magnamycin †	0	0

* Wet method

† More recently, strains resistant to these two agents have been isolated in this laboratory

Table 3—Correlation of Antibiotic Resistance of 125 Strains of Staphylococci

Pattern of Antibiotic Resistance	Group	Strains Number	Strains Per cent
None	I	28	22
Penicillin	II	35	27.8
Penicillin Streptomycin Aureomycin Terramycin	III	49	39.5
Penicillin Streptomycin Aureomycin Terramycin Chloromycetin	IV	5	4.1
Miscellaneous	V	8	6.6

most frequently encountered strain is the strain which is resistant to penicillin, streptomycin, aureomycin, and terramycin. Obviously, it is no longer possible for the clinician to select an antibiotic at will for the treatment of staphylococcal infection, for the increasing resistance of strains to the three most commonly used antibiotics, penicillin, aureomycin, and terramycin, points to the necessity for laboratory-sensitivity testing as a guide in therapy. This may be done simply and accurately by the routine use of the disk test with the saving of time and effort involved in carrying out the tube dilution method. Although in our study the "wet" disk method [5] was used, there is no evidence to indicate that the results would differ if the "dried" disks prepared by the Difco Laboratories had been employed. The clinician, in selecting the agent of choice on the basis of the laboratory-sensitivity test, obviously presupposes a high degree of correlation between the in vitro-in vivo activity of the antibiotic agents. Although there is much evidence for such an assumption, there is great need for further correlative studies similar to that of Lind.[8]

Accumulating evidence [4] indicates that staphylococci are rapidly becoming the most important and most common cause of bacterial infection. Within the past two years in this institution it has been evident that the incidence of severe staphylococcal infections of man are increasing, and it is apparent that the increase is related to the increase in antibiotic-resistant strains. Of particular importance is staphylococcal pneumonia which develops postsurgically or following a primary bacterial or viral pneumonic infection. In this laboratory the coagulase-positive staphylococcus is the most frequently isolated organism from positive blood cultures, some from cases of subacute bacterial endocarditis, others from septicemias secondary to other primary foci of infection. Postoperative infections are most often due to this group of Gram-positive cocci. There is but little doubt that the widespread use of antibiotics, both therapeutically and prophylactically, is responsible for the rise in these infections, for many of the resistant staphylococci encountered in these infections are from patients who have received antibiotics. Many of the strains fall into our resistance Group III, namely, those resistant to all agents except erythromycin, magnamycin, and chloromycetin. In view of the potential toxicity of chloromycetin, it has been indeed fortunate that erythromycin and magnamycin have been currently available for treatment of these infections.

Of particular concern are the reports of staphylococcal infection specifically developing secondary to antibiotic therapy. Such an infection, particularly a staphylococcal enteritis as described by Dearing and Heilman,[9] develops following prophylactic and therapeutic use of the broad-spectrum antibiotics. In such cases antibiotic-resistant strains of staphylococci have been isolated from the intestinal tract. Following the administration of erythromycin to such patients, these organisms disappeared and symptoms were promptly alleviated. Of grave concern is the report of deaths [9] occurring in certain of these cases. Just how widespread may be the occurrence of this apparently distinct clinical entity is not known. Although it has been observed only in certain parts of the country, it is important that the clinician recognize the possibility of its occurrence so that prompt action can be taken to prevent death of patients receiving chemotherapy.

In attempting to find methods of combating this important problem, the question of major public health importance is the source of these antibiotic-resistant staphylococci. As pointed out by Welch,[10] it is apparent that the increase in these staphylococci is pri-

marily seen in hospitalized patients. As shown by Barber, et al.,[11] and Dowling, et al., [12] the tendency for such strains to spread readily among patients accounts for the general increase in infection due to such strains. In a recent report by Lepper, et al.,[13] it was shown that the incidence of strains resistant to erythromycin rose from 0 to 70 per cent in a hospital where this agent was used almost exclusively during a five-month period. When penicillin was reinstituted as the principal antibiotic, the incidence of strains resistant to erythromycin dropped to 33 per cent; whereas those resistant to penicillin rose from 35 to 83 per cent.

The question remains as to the mechanisms involved in the appearance of a resistant strain in a patient whose infection was originally caused by a susceptible strain or by some other pathogen. Modern concepts concerning the mutational origin of antibiotic-resistant strains are well known but, despite the great volume of work on this subject, there is very little evidence, with the exception of streptomycin, that staphylococci actually become resistant to the other antibiotic agents in vivo by such a mechanism.

The development of resistance by staphylococci to penicillin has been studied more thoroughly than that to any other agent, and the issues appear well defined in the case of this antibiotic. Naturally resistant strains produce penicillinase which is primarily responsible for their resistance. (Strains rendered resistant "artificially" in the laboratory do not produce the enzyme.) It is the strains which produce the enzyme that are encountered clinically in infections which are refractory to penicillin therapy. There is some recent evidence [14] that susceptible strains contain penicillinase-producing mutants. Such a mutation could conceivably account for the in vivo development of resistant strains. However, one must not overlook the possibility that resistant strains of staphylococci are present at all times in the normal flora of the body, particularly the skin, nasopharynx, and intestinal tract. Such strains might readily become superimposed upon an infection when the susceptible strain is eliminated.

Little is known about the mechanisms involved in the development of strains resistant to aureomycin and terramycin. Again, with these two agents, it appears likely that such strains genetically unrelated to the primary strain become superimposed upon an infection when the former is eliminated. It is anticipated that phage typing [15] of strains isolated during various stages of an infection may eventually throw light on some of the potential mechanisms involved in the development of resistance.

The control of infection by resistant staphylococci is a major public health problem which obviously awaits further studies of a fundamental nature. In the meanwhile, steps can be taken to prevent spread of staphylococcal infection in hospital wards. Consideration should be given to the possible isolation of infected patients and to the removal of personnel from duty who are carriers of resistant strains. At the present time the most obvious answer to the problem is the continual development of new antibiotic agents and the discarding, at least temporarily, of those now in use. In view of the vigorous search which is going on for new agents such a prospect is not unlikely. Another possible method of control is the simultaneous administration of two or more agents in the prophylactic and therapeutic management of infection in man. Evidence is accumulating that such "combined" therapy may retard the appearance of resistant strains,[7] and further study along these lines is definitely indicated. It is imperative that more study be undertaken to determine mechanisms of resistance in this group

of organisms. In the case of resistance to penicillin the enzyme, penicillinase, is known to be the primary factor. If the action of the enzyme or its production by the cell could be inhibited, penicillin could be reinstituted as the agent of choice in the therapy of staphylococcal infection.

Summary

A survey of the antibiotic sensitivity of 125 recently isolated strains of staphylococci indicates that the percentage of resistant strains is increasing. As the tube dilution and disk methods of determining sensitivity of this group of organisms compare favorably, the latter method is recommended as a routine procedure in the hospital laboratory to serve as a guide in therapy. A general increase in staphylococcal infections is probably related to the increased incidence of antibiotic-resistant strains, and control of infection due to them constitutes an important public health problem.

REFERENCES

1. Needham, G. M., and Nichols, D. R. Recent Changes in Sensitivity of Micrococcus pyogenes to Various Antibiotic Agents. J. Lab. & Clin. Med. 41:150–156 (Jan.), 1953.
2. Kirby, W. M. M., and Abera, J. J. Changing Pattern of Resistance of Staphylococci to Antibiotics. Antibiot. & Chemother. 3:831–835 (Aug.), 1953.
3. Finland, M., and Haight, T. H. Antibiotic Resistance of Pathogenic Staphylococci. Arch. Int. Med. 91:143–158 (Feb.), 1953.
4. Prissick, F. H. Antibiotic-Resistant Staphylococci and Related Infections. Am. J. M. Sci. 225:299–319 (Mar.), 1953.
5. Bondi, A.; Spaulding, E. H.; Smith, D. E.; and Dietz, C. C. A Routine Method for the Rapid Determination of Susceptibility to Penicillin and Other Antibiotics. Ibid. 214:221–225 (Feb.), 1947.
6. Bondi, A., and Dietz, C. C. Penicillin Resistant Staphylococci. Proc. Soc. Exper. Biol. & Med. 60: 55–58 (Oct.), 1945.
7. Wright, S. S.; Purcell, E. M.; Wilcox, C.; Broderick, M. K.; and Finland, M. Antibiotic Combinations and Resistance to Antibiotics: Development of Resistance During Repeated Subcultures of Staphylococci and Certain Streptococci on Media Containing Penicillin, Streptomycin, Erythromycin, Terramycin, and Chloramphenicol Used Singly and in Pairs. J. Lab. & Clin. Med. 42: 877–895 (Dec.), 1953.
8. Lind, H. E. The Rationale of Routine Antibiotic Sensitivity Determinations. Antibiot. & Chemother. 3:672–676 (July), 1953.
9. Dearing, W. H., and Heilman, F. R. Micrococcic (Staphylococci) Enteritis as a Complication of Antibiotic Therapy: Its Response to Erythromycin. Proc. Staff Meet. Mayo Clin. 28:121–134 (Mar. 11), 1953.
10. Welch, H. Editorial. The Antibiotic-Resistant Staphylococci. Antibiot. & Chemother. 3:561–570 (June), 1953.
11. Barber, M., and Rorwadowska-Dowzenko, M. Infection by Penicillin-Resistant Staphylococci. Lancet. 2:641–644 (Oct. 28), 1948.
12. Dowling, H. F.; Lepper, M. H.; and Jackson, G. G. Observations on the Epidemiological Spread of Antibiotic-Resistant Staphylococci, with Measurements of the Changes in Sensitivity to Penicillin and Aureomycin. A.J.P.H. 43:860–868 (July), 1953.
13. Lepper, M. H.; Dowling, H. F.; Jackson, G. G.; Moulton, B.; and Spies, H. W. Effect of Antibiotic Usage in the Hospital on the Incidence of Antibiotic-Resistant Strains Among Personnel Carrying Staphylococci. J. Lab. & Clin Med. 42:832 (Nov.), 1953.
14. Szybalski, W. "Natural" and "Artificial" Penicillin Resistance in Staphylococci (Micrococcus pyogenes var. aureus). Antibiot. & Chemother. 3:915–918 (Sept.), 1953.
15. Blair, J. E., and Carr, M. The Bacteriophage Typing of Staphylococci. J. Infect. Dis. 93:1–13 (July-Aug.), 1953.

The Power of Statistics

An antifluoridation advertisement in a Michigan newspaper states (apparently with a straight face) that 114.5 per cent of deaths in New Mexico are due to senility. Is this an invitation for those who though still alive are yet dead, to move on and make way for the younger generation?

Laboratory Aspects of Tuberculosis in the Ambulatory Patient

DANIEL WIDELOCK, Ph.D., F.A.P.H.A., and ARTHUR B. ROBINS, M.D., F.A.P.H.A.

If more tuberculosis patients are to be treated, or given part of their treatment, outside the hospital, adequate public health safeguards will depend upon more revealing laboratory checks. All this lends added interest to the new laboratory services being offered by New York City laboratories.

✢ Active participation of public health agencies in the treatment of unhospitalized patients with tuberculosis is now essential. The need arises from three directions. Patients awaiting admittance to hospitals require treatment to check the progress of their disease and its spread to others. An increasing number of cases are being discharged from institutions with a recommendation that chemotherapy be continued for long periods. Finally, there are always present in the community a large number of persons with communicable tuberculosis who will not accept institutional care and represent a major public health hazard.

In July, 1953, the New York. City Department of Health started a program for the antibacterial treatment of unhospitalized patients with tuberculosis. This policy implied that both the clinic and the laboratory consider each unhospitalized patient as a candidate for treatment. The laboratory can therefore no longer merely report to the clinician the presence or absence of acid-fast bacilli. The service offered had to be equivalent to that of a good tuberculosis hospital laboratory. This meant complete bacteriological studies of the patient at the time he first reports to the clinic. It therefore became necessary for the laboratory to devise a practical program to assist the tuberculosis clinics in evaluating the progress of their patients. This program had to include:

(1) A reliable diagnostic method.

(2) A technic of estimating the number of tubercle bacilli in the sputum in order to indicate the bacteriological progress of the ambulatory patient while under treatment. As the routine reporting of cultures as positive or negative gives no idea of the increase or decrease of tubercle bacilli during the course of treatment, we adopted the device of roughly estimating the number of colonies produced on culture.

(3) The routine testing of the tubercle bacilli for sensitivity to the drugs employed. How should we test for and report the development of the resistance against the drugs? What should be considered as a significant resistance?

(4) It also became important for us to draw some conclusion with regard to the relationship between virulence of the tubercle bacilli and the development of resistance to isoniazid. Evidence had been presented by some investigators [1, 2] that tubercle bacilli resistant to isoniazid may become avirulent.

In this paper we summarize our thoughts concerning these problems and offer a technic by which the clinician may be assisted in determining the bacteriological progress of his unhospitalized patient under treatment.

Culture vs. Smear

The insensitivity of the smear as compared to the culture technic is well known. In our laboratory sputums were examined by both technics to determine the value of the smear. The details were reported in a previous publication.[3] Suffice it to say that the smear results were too unreliable for use as part of our routine procedure. We are therefore culturing all sputums of the unhospitalized patients participating in this program, the smear technic being no longer part of the routine.

Culture Count

In a previous paper,[3] evidence was offered for the replacement of the Gaffky count with a rough colony count reported as follows:

4+ = confluent growth, no particulate colonies
3+ = particulate colonies, too numerous to count
2+ = 200 colonies to numbers too great to count
1+ = 50-200 colonies
<1+ = under 50 colonies; number of colonies reported as found

This procedure proved to be a reliable and consistent technic when a series of sputums of individual patients are examined weekly or bimonthly. By using this procedure it is possible for both the laboratory and the clinician to follow the bacteriological progress of a patient during the course of his treatment. We employed a rough semiquantitative method which nevertheless proved to be more sensitive and more reliable than the counting of tubercle bacilli on smears.

When results obtained from any one patient are plotted, we obtain pictures such as are illustrated in Figure 1. For example, the bacteriological graph of patient, M.P. (Figure 1a) illustrates how the number of organisms was reduced from a 4+ culture to a <1+ culture after five weeks of treatment with isoniazid. The culture count's increase was concomitant with the appearance of resistant organisms. The high culture count remained at the same level until about the 33rd week when streptomycin was substituted for isoniazid. The culture count became negative and remained so from the 37th to the 43rd week. This bacteriological picture could not be obtained if the culture results were merely reported as positive or negative, nor was the use of smears of any help.

Other examples of the types of bacteriological curves observed are illustrated in Figures 1b and 1c. Figure 1b indicates that the organisms of the patient, A.D., began to increase in number at about the ninth week when resistance developed and remained at a high level during the entire period of study. On the other hand, in Figure 1c we note the gradual decrease in numbers of organisms until the sputums were consistently negative.

This reporting procedure was tried by the laboratory for one year, during which period more than 100 ambulatory patients were tested either weekly or bimonthly while under treatment. As a result of our experience with this group, the New York City Department of Health is now reporting all culture results by the 4+, 3+, etc., scale.

Sensitivity Testing

In general, two types of procedures are employed by laboratories when testing tubercle bacilli for sensitivity to

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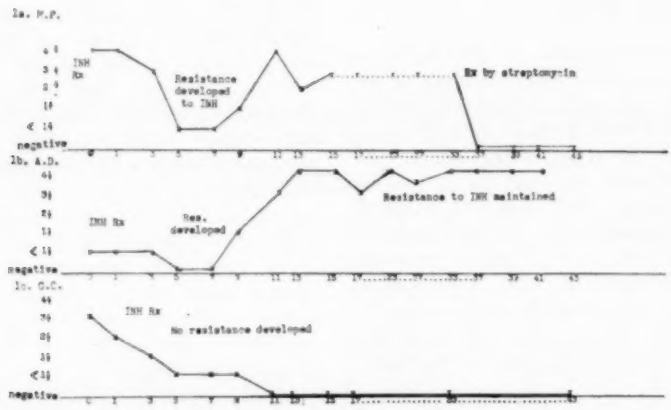

Figure 1—Representative Curves Indicating the Bacteriological Progress of Unhospitalized Tuberculosis Patients Under Treatment

drugs: direct inoculation of the drug-containing media with concentrates of the sputum; or the indirect procedure of first obtaining the organism in pure culture, and then transferring selected colonies to the drug-containing media.

Experiments conducted in our laboratory [4] indicate the inaccuracy of the indirect technic. Pure cultures of tubercle bacilli resistant to 100 μg of INH (Isoniazid Hydrazid Nydrazid) were transferred to drug-free media (Proskauer-Beck). Organisms from the drug-free media were then inoculated onto media containing 1, 5, 10, 25, and 100 μg of INH. After suitable incubation, the controls showed a typical 4+ growth, whereas the media containing 100 μg, 25 μg, and 10 μg showed growth ranging from <1+ to 1+. Even the media containing only 5 μg or 1 μg showed a reduced growth as compared with the controls. The organisms that were originally resistant to 100 μg, after growing once on a drug-free medium became more sensitive to the INH. Therefore, sputums containing resistant organisms should be tested directly upon INH-containing media and thus by-pass the preliminary step required in the indirect technic of first isolating organisms in pure culture on the drug-free media. This laboratory is consequently routinely employing the direct technic of inoculating a definite (0.25 ml.) quantity of sputum concentrate on drug-containing solid media simultaneously with the controls. The degree of growth on both the control and drug-containing tubes are then reported.

The advantages of this procedure include:

(1) Elimination of changes in resistance following growth on drug-free media.

(2) A more accurate picture of relative numbers of resistant and sensitive organisms present in the sputum. (For example, the control tube and 1.0 μg INH tube may both be 4+, or the INH tube may be <1+ with the control tube 4+).

(3) Saving of time required to isolate the organisms in pure culture.

Using the technic as outlined, we attempted to ascertain the significance of the development of resistant organisms. As the details of these experiments have been reported elsewhere,[3, 5] the pertinent results need only to be summarized here:

(1) The development of resistance to 0.1 μg INH is to be considered as a warning that greater resistance may soon develop. If resistance is present to 1 or 5 μg INH, it is probable that the culture count will remain at least 1+ and in most instances 2+ to 4+.

(2) When worsening is noted on the x-ray, after eight months of treatment with INH, resistance to 1 μg or more of INH is probably also present. The routine of the laboratory therefore is to test each sputum for sensitiviy to 1.0 μg INH, as well as for the usual 100 μg streptomycin.

In vitro experiments, as noted previously, indicated that removal of the resistant organisms from further contact with INH resulted in an increase in the sensitivity of the tubercle bacilli. Experiments in man do not confirm these results, as evidenced by the following: ambulatory patients who were treated for eight months with isoniazid were divided into three groups and studied for an additional three months; one-third were continued on isoniazid, one-third treated with streptomycin and PAS, and one-third received no therapy. Resistance to isoniazid was maintained by all three groups during this last three-month study. Neither discontinuance of INH by the patient nor the substitution of streptomycin had any effect upon the decrease in resistance to INH, except, of course, in those patients who became negative following the streptomycin therapy. The remainder retained the same resistance level developed prior to the interruption of the isoniazid therapy. Further studies on this group are in progress.

Virulence of Resistant Organisms

As previously indicated, some investigators have introduced doubt as to the virulence of organisms resistant to INH. We investigated this problem because of the public health implications with the findings that follow: The virulence of resistant organisms depends upon the host animal. When resistant organisms were grown on drug-free media and inoculated into mice,[6] no differences in virulence were observed between the resistant and the sensitive organisms. When guinea pigs were inoculated with resistant organisms which had been grown on drug-free media,[7] the tuberculous infection was less rapidly progressive and less rapidly lethal. However, the organisms caused progressive disease as indicated by the positive tuberculin test in all guinea pigs, in the development of lesions containing viable bacilli, and in some cases death. As for man, there was no difference between organisms isolated from patients who had shown clinical improvement and deterioration on x-ray when these organisms were inoculated into mice.[6] Moreover, whenever we obtained a worsening on x-ray both resistant organisms and high culture count were present. We must consider, from a public health point of view, that tubercle bacilli resistant to isoniazid are virulent organisms.

Summary

1. The treatment of the unhospitalized tuberculosis patient is now a basic part of the tuberculosis control program of the New York City Department of Health.

2. This has required the adoption of a laboratory program consisting of growing each sputum on culture media, as well as testing for sensitivity to the drugs employed.

3. All sputum concentrates are inoculated directly on culture media containing no drug, as well as on media containing 1.0 μg INH and 100 μg streptomycin. The amount of growth is then reported for each inoculum according to a 4+, 3+, 2+, 1+, <1+ scale, as outlined in the text.

4. The probable virulence of tubercle bacilli resistant to isoniazid is discussed, and it is concluded that clinical evidence of virulence can usually be demonstrated when resistant organisms are present.

REFERENCES

1. Steenken, W., Jr., and Wolinsky, E. Virulence of Tubercle Bacilli Recovered from Patients Treated

with Isoniazid. Am. Rev. Tuberc. 68:548 (Oct.), 1953.
2. Middlebrook, G., and Cohn, M. L. Some Observations on the Pathogenicity of Isoniazid-Resistant Variants of Tubercle Bacilli. Science 118:297 (Sept.), 1953.
3. Widelock, D.; Peizer, L. R.; and Dangler, C. Laboratory Diagnostic Procedures Employed on Sputum Specimens from Ambulatory Tuberculous Patients Treated with Isoniazid. Am. Rev. Tuberc. (To be published.)
4. Peizer, L. R.; Widelock, D.; and Klein, S. Effect of Isoniazid on the Viability of Isoniazid-Sensitive and Resistant Cultures of M. tuberculosis. Ibid. (In Press.)
5. Robins, A. B.; Abeles, H.; Chaves, A. D.; Aronshon, H. H.; Breuer, J.; Widelock, D.; and Peizer, L. The Unhospitalized Tuberculosis Patient. Ibid. 69: 26 (Jan.), 1954.
6. Bloch, H.; Widelock, D.; and Peizer, L. Susceptibility to Isoniazid and Pathogenicity of Tubercle Bacilli. Ibid. 68:734 (Nov.), 1953.
7. Peizer, L.; Widelock, D.; and Klein, S. Virulence in Guinea Pigs of Isoniazid Resistant Cultures Isolated from Clinical Specimens. A Preliminary Report. Ibid. 68:290 (Aug.), 1953.

American College of Preventive Medicine Organized

At an informal meeting of diplomates of the American Board of Preventive Medicine, Inc., held April 21 in St. Petersburg, Fla., steps were taken to organize an American College of Preventive Medicine. About 30 diplomates of the board were present.

Recognizing that diplomates of the American Board of Preventive Medicine have organized state academies of preventive medicine in four southern states, steps were taken to set up a College of Preventive Medicine comparable to organizations of similar name composed of the diplomates of other specialty boards. Among the purposes included in the resolution which was adopted were those of encouraging and aiding medical colleges in establishing a system of teaching and dignifying preventive medicine; the enhancement and maintenance of the interest of physicians in preventive medicine; maintenance and advancement of the highest possible standards in preventive medical education, practice, and research; encouragement of the several schools of public health in the universities; the maintenance of high standards in the specialty of preventive medicine; and the promotion of the public welfare in connection with the specialty of public health. Any diplomates who sign the constitution prior to the adjournment of the next called meeting of the college are to be designated as charter members of the American College of Preventive Medicine. Such charter members "shall be designated Fellows and shall be entitled to affix the capital letters F.A.C.P.M. after their signatures." It is the declared intent of the college to work "in close cooperation and harmony with the American Medical Association, the American Public Health Association and the American Board of Preventive Medicine."

Elected as officers were the following persons:

President—George Dame, M.D., Florida State Department of Health, Jacksonville

President-Elect—J. W. R. Norton, M.D., North Carolina State Department of Health, Raleigh

Vice-Presidents, First—Ben F. Wyman, M.D., State Department of Health, Columbia, S. C.; Second—Thomas F. Sellers, M.D., State Department of Health, Atlanta, Ga.; Third—George A. Denison, M.D., City-County Department of Health, Birmingham, Ala.

Secretary—T. Paul Haney, M.D., City-County Department of Health, Tulsa, Okla.

Treasurer—John W. Wright, M.D., North Carolina School of Public Health, Chapel Hill

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WHO News from the Field

✣ The WHO Newsletter brings us each month challenging pictures of progress being made under the auspices of the WHO in the extension of the public health program to far-off countries in every quarter of the globe.

The issue for January, 1954, points out that more than one-half of the population of Egypt is exposed to infection of bilharziasis, which is estimated to cost £80,000,000 yearly (including diminished production due to loss of manpower and the cost of health services). This disease was described in a papyrus of 4,000 years ago and the presence of this infection can be identified in ancient mummified remains. A coordinated program of control, including reduction of the number of snails, general sanitary measures, and health education, is being conducted by the Egyptian Ministry of Health with the collaboration of the WHO under the Technical Assistance Program.

In the Newsletter of September, 1953, in his article "World Health: the Optimists v. the Pessimists," Abel Wolman points out the importance of furthering an improvement in economic status parallel with the control of disease, since there is no object in replacing deaths from disease by deaths from starvation. Poverty, hunger, and disease are allies equally menacing to the well-being of the people. As Dr. Brock Chisholm has said, "Certain conditions tend to prevent effective transplantation of health techniques—such conditions as unstable government, obsolete land tenure systems, nepotism, insecurity of tenure of civil servants, political appointments to technical positions, ignorance, 'sacred cows' of many colors, shapes and sizes and under many names; poverty, low productivity, graft and corruption, irresponsibility in using international relationships for internal political purposes, excessive nationalism, excessive birth rates, and extensive misrepresentation of facts and of motives." Unless social and economic reforms are introduced simultaneously with health reforms, "prophets of doom," such as Dr. William Vogt, may be confirmed in their viewpoint that America's foreign policy in saving people is resulting in more people, with less to eat, than ever before. This point is stressed by the International Development Board which finds that: "hunger and ill health cast a common shadow for most of the billions of people in the underdeveloped areas."

Professor Wolman concludes that the single-purpose operation alone, however, militant and enthusiastic it may be, is insufficient. The success of the world health program can only be achieved by multipurpose activity; real progress in this field "demands a concomitant production of food, a rise in the entire economy and the education and training of the total population. . . . The saving of life

leading to the destruction of life need not be an inevitable result of humanitarian effort even in a few places, provided a philosophy of 'wholeness' dominates the design of our health programme."

Fortunately, it is by no means difficult to link the control of disease with a program for an increasing economic standard of life for the area concerned. How effectively this end can be achieved is proved by the "Malaria Balance Sheet" published in the WHO Newsletter for February, 1954: "Before malaria control, fewer than five thousand people lived in the town of Puli Khumri in Afghanistan where there are textile mills. At that time the output of the mills was twenty thousand meters a day. Following malaria control, the population of the town has risen to twenty thousand people and the output of the mills in 1952 was 35,000 meters a day. Since malaria control became effective in 1947, Ceylon has reclaimed and brought under irrigation more than 206 square miles of previously uninhabitable malarious jungle for settlements. More than 91,000 landless people have now been established in 26 new colonization schemes. Detailed economic surveys were made among all income groups in an irrigated area of Mysore State, India, before and after residual DDT house-spraying for malaria control.

"These surveys arrived at a minimum estimate of 498,898 rupees saved by 730 families during one year of malaria control. It was also stated that for every rupee spent on DDT spraying there was a gain of 93 rupees during the year as measured in comparison with the unsprayed area.

"In northern Thailand a socio-economic survey established that each malaria case incapacitated its victim for an average of 7.6 days. In DDT-sprayed areas of 282,265 population, more than 50,000 malaria cases are estimated to have been prevented within one year after control began. Since about half the population are workers, this means that no fewer than 25,000 work-weeks, or 173,000 man-days were saved."

After all, the healthy human being in most areas of the world can produce more than he consumes. The control of bilharziasis, malaria, and tuberculosis means not only more people, but more prosperous and more productive people as well.

Housing in Southeast Asia

✣ A comparatively new concern of public health is the economic gap between our ideals of health and their attainment. Nowhere is this phenomenon greater than in the field of housing. In a country such as the United States, the gap between what the low-income groups can pay and the basic cost of healthful housing is so great that it can only be bridged by government action in the form of subsidy. If this is true in Great Britain and the United States, it can be imagined how much greater this gap will be in less fortunate areas of the world.

For countries existing on a primitive economy, it has been believed that the "mud hut" represents the most practical avenue of approach to housing the population. In recent years experiments have been made in many parts of the world, notably in Australia, the United States, and South Africa, in methods of mixing with earth some stabilizer, such as cement, asphalt, or lime, so that solid, durable houses can be built with this most abundant and cheap of materials—earth. To get good "stabilized earth" for building, however, calls for more than the haphazard mixing of a little cement with any earth that may happen to be available. The quality of local soil has to be carefully analyzed and the best possible mix deter-

mined by thorough research and experiment. This is obviously a task beyond the capabilities of the average villager and governments can and should be of great assistance.

The United Nations and many of its specialized agencies during January and February sponsored with the Indian government a special working party, an international seminar, and an international exhibition on housing, the first of its kind in the world. These sessions on housing and community improvement were held at New Delhi and were widely attended by representatives of many countries of Southeast Asia. The International Exhibition of Low-Cost Housing demonstrated practical methods of increasing the effective use and production of local building materials by means of a model village of 80 homes. The village was modest and simple. It was not a village of dream houses, but a village which could become the reality of Asia's tomorrow. There was the village center, adequately equipped for those communal activities which give coherence to the aspirations of the local community. The health clinic and the school, a cooperative store, carpenter's shop and smithy, properly planned streets, adequate water supply, lighting, and drainage all had their place. The houses were adapted to their environment, yet no single building technic alone was used and the concept was not sparked by any one school of architects. Most important of all, not a single house cost more than 5,000 rupees (approximately $1,000), and many cost a great deal less.

Recent estimates indicate that even if the prewar rate of housing construction were doubled it would take the average country in Europe more than 20 years to catch up with its housing needs—ranging from six years in Sweden to 150 years in Greece. In Asia, Africa, and Latin America the situation is far worse. A lack of statistics in these countries makes it difficult to measure the full extent of the problem. An indication of its magnitude relative to that of industrialized countries can be gathered from the fact that, whereas in the latter from 60 per cent to 80 per cent of all dwelling units have one or less occupant per room, in typically underdeveloped countries from 60 per cent to 80 per cent have about three or more—sometimes as many as two whole families. Latest rough estimates suggest that, in Asia alone, there are over 150 million families living in overcrowded, unsanitary, and substandard quarters. These living conditions in turn menace the health and well-being of practically the entire population and constitute a drag on all national and international efforts to bring about economic and social advancement.

The essential requirement for solving the housing problems of industrialized countries is modernization of the building industry combined with sound financing methods designed to cushion the cost to the lower income groups and to make it possible for them to buy or rent decent living quarters. In the underdeveloped countries the situation is a different one. There is bad housing resulting from past ignorance and as industrialization gets under way the population drift is to urban centers entirely unequipped to meet the growing shelter needs of an expanding population. Underdeveloped areas should have the advantage of being able to learn from the mistakes of those countries which were developing in the last century and to plan their new industrial towns so that they can grow without overcrowding but they also have obstacles which make their task far greater than even the formidable one with which the advanced countries are faced.

Existing standards of housing are lower and the bulk of the population is still unfamiliar with the rudiments of sanitation and health. The people and the govern-

ments have so little money that all but the most modest forms of public financing are ruled out. There exists no sizable building industry and only a very small pool of skilled builders on which to draw. Though labor is cheap, it is in general rather inefficient; many materials have to be imported and transportation is inadequate. The cost of building a standard house with conventional building materials is often as high, or higher, in the underdeveloped country as in the more advanced. If the lower income groups in industrialized countries, where annual per capita income ranges from about $400 to over $1,000, cannot afford to pay the price it costs to build a house, much less can the average peasant or workman in Asia, Africa, or Latin America, where income ranges from about $27 to $350 per capita annually.

It is of great interest and satisfaction to note that this conference at New Delhi (and most of the advancement on any large scale in other parts of the world) has been inspired by the central and specialized agencies of the United Nations itself. We may be proud that the movement has been outstandingly fostered in the United States by the American Public Health Association through its Committee on the Hygiene of Housing, so that health objectives have been dominant in the evolution of our United States policy. Housing programs must go hand in hand with programs to improve health, education, agriculture, and industry.

Accidents in the Factory and in the Home

✢ The Connecticut State Medical Journal for February contains an article on home accidents which we commend to our readers. It is pointed out that in the United States in 1952 there were 2,000,000 persons injured while at work and 15,000 more were killed. In comparison, 4,300,000 persons were injured in the home and 29,000 killed. Accidents of all types are the leading cause of death among persons from one to 35 years of age. When we consider the efforts put forward by labor departments and by industry for the control of industrial accidents and the meager beginning of our efforts to control home accidents, these figures offer a tremendous challenge.

Congress Broadens Its Concept of Health?

✢ An interesting trend is manifest in legislation now before Congress which provides for the expansion of the Hill-Burton program along lines of special interest to public health workers. Bills under consideration by Congress contemplate expansion of federal grants-in-aid to include diagnostic and treatment facilities, nursing homes, hospitals for the chronically ill, and rehabilitation centers. This sort of expansion of a conventional hospital program, to include diagnosis at one end and rehabilitation at the other, seems a fundamentally sound one. We have too long made the assumption that a sharp boundary line could be drawn between the acutely ill, requiring hospitalization, on the one hand, and the general public on the other. It is encouraging that recognition is now at least beginning to be given to the borderline problems of milder illness and of return of the convalescent to his normal place in society.

Hill-Burton Construction. J.A.M.A. 154, 9:13 (Feb. 27), 1954.

LETTER TO THE EDITOR

TO THE EDITOR:

In the December, 1953, issue of the American Journal of Public Health, Volume 43, on pages 1558 to 1562, Leon J. Warshaw, M.D., reports on "Bactericidal and Fungicidal Effects of Ozone on Deliberately Contaminated 3-D Viewers."

In this article, Dr. Warshaw states: "The experiments reported above demonstrate that ozone is capable of reducing deliberate surface contamination with pure cultures of a variety of bacteria and fungi to a level which would preclude the possibility of transmiting infection by casual contact. They confirm an earlier series of observations (unpublished) on the ability of ozone to sanitize contaminated dishes, cutlery, and glassware. Surgical sterility was not attempted, but it is possible that even this might be achieved by the use of higher concentrations or by the use of longer exposures or both. However, exposure to an ozone concentration of 200 p.p.m. for a period of 30 minutes would seem to be sufficient to eliminate the danger of spread of infection by the reuse of viewers needed for seeing three-dimensional films."

The results of experiments conducted in the Division of Laboratories, Chicago Board of Health, are not in agreement with the findings of Dr. Warshaw.

The ozone generator used in our experiments was Model C Ozone Generator built by the Electro-Aire Corporation, Long Island City, N. Y. This unit reportedly produces approximately 6 to 8 grams of ozone per hour.

Polaroid viewers were contaminated with freshly grown and quantitated cultures of Micrococcus pyogenes var. aureus, Escherichia coli, Bacillus cereus var. mycoides, and Monilia albicans.

Sixteen viewers were contaminated with 0.1 ml. of the culture of Micrococcus pyogenes var. aureus. Eight of these viewers were exposed to a continuous flow of an atmosphere containing ozone in the generator named above. At the end of 30 minutes, four viewers were removed from the cabinet. At the end of 60 minutes the other four viewers were removed. At the same time the other eight viewers were placed in a plain metal cabinet at room temperature (70° F.). At the end of 30 minutes, four viewers were removed from the cabinet and at the end of 60 minutes the last four viewers were removed. When each group of four viewers was removed, swabs were taken into fluid medium and aliquots plated out for counting.

Sixteen viewers were similarly contaminated with each of the other three organisms, in turn, and were subjected to the same routine.

The average findings are shown below.

Exposure of contaminated viewers to ozone in the generator named did not destroy an appreciably greater number of bacteria than were destroyed by mere drying and exposure to the air. Sterilization was not accomplished. The bacteria remaining were too great in number to justify the statement that the viewers were properly sanitized.

It was concluded that ozone in the generator used was not a suitable method for the sanitizing of 3-D viewers.

Ozone is a fairly effective bactericide

	M. aureus	E. coli	B. cereus	M. albicans
Viewers in air, 30 min.	5,135,000	230,000	750,000	700,000
Viewers in air, 60 min.	4,615,000	105,000	300,000	410,000
Viewers in ozone, 30 min.	4,842,000	330,000	477,000	1,137,500
Viewers in ozone, 60 min.	3,087,000	410,000	250,000	480,000

when ozonized air is bubbled through bacterial suspensions. No reports, other than the one quoted above, have been found concerning the effect of ozone on dried organisms. The inability of bactericidal or any other vapors to penetrate dried serum, mucus and pus is well recognized. It is these contaminations of infected serum, mucus and pus which will transmit disease when they occur on 3-D viewers or any other item for personal use.

In our opinion, therefore, methods for the sanitizing of 3-D viewers must include either (1) complete immersion in a detergent solution, followed by rinsing, immersion in a disinfecting solution, and again rinsing, or (2) where complete immersion is not possible, due to the use of cardboard or a water soluble polarizing film, the plastic frames should be wiped thoroughly with a cloth saturated with a solution of an accepted disinfectant. Viewers made entirely of cardboard should be discarded after one use.

Please be assured that this letter is written to you in a spirit of helpfulness and cooperation.

HERMAN N. BUNDESEN, M.D.
President
FRANCIS A. DULAK, M.D.
Secretary
Board of Health,
Chicago, Ill.
March 15, 1954.

Montana Health Officers Organize

The full-time local health officers of Montana recently organized a state-wide association. Temporary chairman and secretary, respectively, are Carl W. Hammer, M.D., Bozeman-Gallatin health officer, and Mary E. Soules, M.D., Missoula-Mineral Counties health officer. The association hopes to have representation on the State Health Planning Council and on the Narcotic and Alcohol Advisory Committee to the State Board of Health.

At an April meeting with the staff of the State Health Department proposed changes in the Montana Reportable Disease Regulations were reviewed, as well as local-state financial relationships, and local public health activity reporting and procedures.

A COMMITTEE REPORT

Field Training for Sanitation Personnel—A Guide

Fourth Annual Report of the Subcommittee on Field Training of the Committee on Training: Engineering Section

✢ The report is released under the title "A Guide to Field Training for Sanitation Personnel in Public Health." Its approval was voted by the Engineering Section.

In addition to a foreword and a bibliography, the chapters of the report are as follows:

I. Introduction—This describes field training and relates it to academic training for the total and adequate preparation of sanitation workers.

II. Definitions of Field Training—The definitions and terminology used in the report are explained so as to avoid confusion among the readers. Descriptions are included for the following: field training, observation, orientation, supervised field experience, and apprenticeship.

III. Objectives of Field Training for Sanitation Personnel—The general objectives of field training which apply to all public health disciplines are outlined. In addition, 16 objectives which are specific to sanitation personnel are listed.

IV. Types of Sanitation Personnel to Be Trained—This briefly describes the desirable training experience, both academic and field, for the following types of sanitation personnel: engineer, public health or sanitary engineer, sanitarian and sanitary inspector.

V. Principles and Practices of Field Training—The principles and practices employed in the conduct of supervised field experience programs in order to attain the objectives of these programs are outlined. A field training program time schedule is given for the engineer, the public health or sanitary engineer, the sanitarian, the professional sanitarian and the sanitary inspector. The suggested subject matter, with sequence and duration, is indicated for each of the orientation, observation, and participation elements of the supervised field experience program.

VI. Criteria for Field Training Areas—Interim minimum standards for field training areas are suggested.

VII. Administration and Supervision of Field Training Programs—Three established patterns of field training are described. Principles of administration and supervision are discussed. Interrelationships between agencies involved in training programs and responsibilities of each agency are outlined.

VIII. Financing Field Training Programs—Some principles with related experiences gained from areas that are experimenting with planned training programs are offered.

IX. Evaluation of Field Training Programs—An evaluation schedule is suggested for use in rating sanitation field training programs. It lists 17 criteria to measure essential objectives, principles, and practices of field training programs and offers compliance standards to guide evaluation ratings.

X. Miscellaneous Considerations — Field training is differentiated from inservice or continued education. Field training is related to recruitment programs and to merit system requirements.

This report was presented before the Engineering Section of the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 10, 1953.

In the preparation of the guide, the subcommittee has sought information and advice from state departments of health, local training center health departments, the W. K. Kellogg Foundation, schools of public health, and the Public Health Service.

Copies of "A Guide to Field Training for Sanitation Personnel in Public Health" are available by writing to the chairman of the subcommittee.

WILLIAM C. GIBSON, M.P.H.
School of Public Health, University of Michigan, Ann Arbor, Mich., Chairman
HAROLD S. ADAMS
HUGH E. EAGAN
HERBERT H. HASSON
CHARLES D. SPANGLER, PH.D.
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Appraisal Method Courses Expanded

Decentralized training in the use of the APHA "Appraisal Method for Measuring the Quality of Housing" is now being provided by the U. S. Public Health Service. Heretofore, special courses have been carried on at the Public Health Service Centers in Atlanta, Ga., and Syracuse, N. Y. Last November a course was given at Waco, Tex., for representatives from the health departments of five Texas cities and the State Department of Health. In early March of 1954 a course was given in Detroit for trainees from the health departments of Detroit and six neighboring communities. As a result of this course Detroit is proceeding with a housing survey of the city and similar surveys are planned in the other cities. The Public Health Service is prepared to provide similar courses for other areas of the country as the demand indicates.

A COMMITTEE REPORT

History of the Engineering Section and Trends of Its Professional Composition

✢ An assumption has grown that for some years the proportion of engineers to nonengineers (mainly sanitarians) in the Engineering Section has been declining, and this has raised the question whether the present name of the section is as representative as it might be made. Thoughtful members have asked themselves if the content of the section programs have evolved appropriately in response to this changing situation, whether they have adequately reflected the interests of the various professions represented, and if not what activities should receive more program emphasis.

At the 1952 meeting in Cleveland an ad hoc committee was formed to look into these questions. During the ensuing year information concerning these points was obtained from a sampling of section membership, analysis of program titles, the responses to questionnaires, and a straw ballot—the last two being circulated in the Engineering Section Newsletter.

At the luncheon meeting of the Engineering Section in New York in 1953 the committee presented the following generalizations based upon this study:

1. The section's numerically predominant professional component remains (as it has been since the section was established) the engineers.
2. This predominance in numbers is being reduced by increases in the sanitarian membership.
3. The programs at the annual meetings during the last 20 years have been broad in scope and have corresponded in general subject content to the distribution of professional groups in the section. It is evident, however, that minor additions or variations in emphasis could be made to the greater satisfaction of both engineers and sanitarians.
4. On the basis of a 19 per cent voting sample, it appears:
   (a) That more members of the section desire to change its name to a broader designation than to retain the present one.
   (b) That the essential partnership of the engineers and sanitarians be recognized in any proposal for a new section designation.

Following this report, the section voted for its members to indicate by mail ballot in the near future their preference for retaining the present name of the Engineering Section or of adopting the designation "Engineering and Sanitation Section."

JUSTIN M. ANDREWS, Sc.D., LL.D.
Assistant Surgeon General and Associate Chief, Bureau of State Services, Public Health Service, Washington, D. C., Chairman
DWIGHT F. METZLER, C.E.
MORTON S. HILBERT, M.P.H.

This report was presented before the Engineering Section of the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 11, 1953.

A COMMITTEE REPORT

Vector Control Legislation—Enabling and Regulatory

Committee on Vector Control: Engineering Section

✣ Control of vectors, the "animal carriers of disease and discomfort to man," such as mosquitoes, flies, rodents, gnats, and ticks, has been traditionally on a decentralized basis in this country, except during periods of national emergency. Because of the importance of local governments in this health activity, the Committee on Vector Control has reviewed two types of legislation: state enabling laws which authorize the residents of local areas to organize and operate abatement districts; and regulatory statutes, state and municipal, which prescribe minimum standards for or otherwise govern the performance of commercial pest control operations. No attempt has been made to assemble a "model" law, but the most generally applicable and valuable principles have been noted.

Following is an abstract of the committee's report. (Complete copies are available, upon request, from the chairman of the committee.)

Enabling Legislation

Fourteen states have laws authorizing formation of special vector control districts, in addition to other statutes permitting establishment of multipurpose districts. The provisions regarding special vector control districts are analyzed under the following:

1. Authority for Formation

Laws should indicate the scope of operations in vector control. Because of the need for flexibility, this provision should read: "There may be formed Vector Control Districts, for the control of vectors of public health importance. . . ." This does not make it mandatory to cover all vectors, since selective operations can be undertaken or withdrawn within this broad authorization.

Existing legislation contains two different provisions concerning the geographical jurisdiction of vector control districts. One type limits districts to existing governmental units; the second type specifically authorizes formation of districts without reference to such boundaries. Since vector habits are not affected by political boundaries, it is necessary to provide for the inclusion of affected areas either by disregarding political boundaries or by authorizing intercounty operations.

Enabling legislation often prescribes some limitations governing the establishment of districts, such as a minimum number of inhabitants, exemptions of certain counties or areas, and exclusion of "home-rule" cities. Objection may

This report was presented before the Engineering Section of the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 10, 1953.

be made to these provisions on the grounds that, although valid at the time of passage, they will not always remain so. It is believed that a better method of insuring the creation of new districts only where needed, is to require state health department approval. This permits consideration of public health needs in the light of current circumstances.

2. Procedures for Formation and Enlargement

Four methods are prescribed among the states for the establishment of vector control districts. One provides that a specified percentage of the landowners or voters in the area concerned may petition. The local legislative authority (e.g., the board of county supervisors) is then required, usually after publication of the petition, to submit the question to the electorate of the area. Another provides for petition by a specified minimum of landowners or voters, the holding of hearings on the proposal, and thereafter decision by the local legislative body or some local official. In the third method, authority to establish districts is vested in the appropriate local legislative body, without petition or hearings. In a fourth type, local authority is authorized to establish districts and must do so upon receipt of a petition or if it declines must submit the question to the electorate.

No single procedure for establishment of vector control districts appears adequate for all instances. The appropriate local legislative authority should be empowered to establish a vector control district and to define its boundaries, without the necessity for petition by the electorate, following hearings if dictated by local preference. Also, provision should be made for the use of petitions, specifying a minimum number of signatures. Upon receiving such a petition, the local legislative body may approve or disapprove establishment of the district, following hearings if believed necessary. In both instances, the matter should be referred to the state health department for its concurrence or other determination.

A potentially critical situation may occur when a segment of territory adjacent to an organized district is a source of vectors but is not subject to control measures. In such cases, authority should be vested in the state government to initiate the establishment of a district or to provide for annexation.

To meet changing needs and to reduce costs, where possible, enlargement of territory and consolidation of adjacent districts should be authorized. The principles governing establishment of districts are valid also for annexation. They are (1) petition from a specified number of citizens, or resolution by the local governing authority, and (2) ultimate approval by the state health department. With respect to consolidation of existing districts, even more simplicity may be achieved by providing, as in certain states, that boards themselves may mutually agree upon consolidation, subject to concurrence of the state health department.

3. Selection of Officials

In 12 states, local membership of vector control commissions or boards is composed of appointive officials. Appointment by established local authorities, such as the county commissioners, appears generally advisable. Length of terms varies from two to five years, or at the pleasure of the appointing authority. Of greater significance is that 10 states have specific provision for staggering terms so that not all appointments expire at the same time.

Ex officio membership from the state health department, and from the agriculture and conservation departments, is provided in several states. This contributes to a balanced program and a

coordination of interests and is recommended.

4. Finance

Most of the state laws specify a maximum level of appropriations for vector control districts. For example, the limitation may be a ceiling of five mills per dollar on real property, or of 10 cents per hundred dollars of taxable property. Two states have minimum levels. Such limitations are understandable but should be carefully established to assure reasonable levels of activity. There should be a considerable spread from the minimum to the maximum and reliance placed on the safeguard provided by an annual review of budgets and operational plans by the state health department or an ex officio review board.

A vital part of financing is the authority for borrowing, both short-term and long-term (bonding). For administrative economy and general financial coordination, such financial operations should be conducted through the established fiscal authorities of local governmental units, rather than separately. This conforms with the procedures established in all states for the collection through taxes of special funds for vector control activities. Disbursements, of course, should be made through regular channels upon the warrant of designated officials of the vector control district.

5. Board Authority and Responsibilities

Vector control boards generally possess authority for internal organization and for conducting operations. One state empowers local boards to promulgate rules and regulations, with the approval of the state board of health; this is desirable since it emphasizes a preventive approach. Among the sanctions specifically available, eight states authorize boards to order cause shown why vector breeding places should not be abated, to hear the respondent owner, and thereafter to order abatement if deemed proper. Other powers commonly vested in boards include: right of entry upon lands for control operations, and authority to acquire lands, easements and rights of way.

Coordination achieved through advance submission of plans to state agencies is common and is recommended. At present, four states submit plans to the state health department. A desirable arrangement would be to establish an ex officio review board with representation from the following state departments: Health, Conservation, and Agriculture. This board should be empowered to approve or modify the annual operation plans.

State Regulation of Commercial Pest Control Activities

1. Scope of Acts

Nine states have laws requiring commercial pest control operators to be licensed. These cover insect and pest control, when performed for profit, including rodent and termite control. Exclusions existing in state laws are: work on one's own property; activities by local, state and federal agencies; research work; agricultural pest control; and work by public utilities on their own property.

2. Responsible Administrative Agency

Because of shifts in emphasis in commercial pest control activities, health departments have recently become more interested in administration of licensing. There are two states in which public health representation is now specified by law in the administration of such programs. The Department of Agriculture and State Plant Board is named in other states.

3. Licensing and Examining Boards

Considerable variation exists in the statutes concerning the composition of

the membership of licensing or examining boards. It seems desirable that the major interests should be represented in such a technical group. These include: pest control operators, public health (environmental sanitation), entomology and agriculture. Qualifications for license applicants, as specified by law, appear to be more stringent in recent enactments. The content of examinations generally is not included in statutes, and should not be, since this is a technical matter requiring revision.

4. Regulatory Powers

In addition to entrance qualifications, much may be gained by authorizing the technical board to promulgate regulations regarding standards of pest control work. Provision should be made for public hearings before adoption. Final approval may be conferred upon the head of the responsible administrative agency. All state laws provide for suspension or revocation of licenses for due cause.

5. Other Powers Authorized

Inspection of completed work and examination of products used; posting of bonds requirement to insure proper completion of work; designation (in one state) of local health departments as cooperating organizations.

Local Regulations of Commercial Pest Control Activities

Briefly, local ordinances have two main objectives: (1) protection against fraudulent or careless practices, and (2) improving standards of commercial pest control work. Generally speaking, state regulation appears preferable to local regulation, although the two need not be mutually exclusive.

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Clearing House on Public Health Salary Information and Personnel Needs

Recruiting Vital Statisticians

The Vital Statistics Section of the American Public Health Association has a Subcommittee on Recruitment of Public Health Statisticians. This committee reported with recommendations at the November, 1953, Annual Meeting. Among the recommendations made were that:

1. The entrance salary must be competitive with that of other positions open to desirable graduates.
2. Personal visits (by statisticians) should be made to college placement offices and, more important still, to individual professors in a position to advise undergraduate students. A mathematics professor teaching at the sophomore or junior level and acquainted with students interested in mathematics can do more for recruiting efforts than any placement counselor who has many other attractive fields to suggest.

   There is value in promoting public health statistics careers by providing student counseling service at the high school level. "Career days" activities for senior high school students should include opportunities in the health statistics field.
3. Job description pamphlets should be used to supplement personal visits.
4. The larger states and cities might during summer vacations employ students who have expressed an interest in public health statistics as a result of recruitment efforts.
5. Scholarship training should be available for the most promising workers after two or three years of experience.
6. Positions of greater responsibility and higher salaries should be filled by promotion from within the organization or from within other health organizations.

Before making its recommendations the committee gathered considerable information about present training and recruitment. In the two years, 1952 and 1953, there were 31 graduate students in public health statistics in eight of the 11 accredited schools of public health. Of these, all but five had already had public health experience. Of the total, only 10 met the cost of training through private resources; for five the schools met the cost; for all the remainder the cost was met by official, or in one case, voluntary health agencies.

College and Planning a Career

"The Right College for Your Career in Recreation" is a recruitment leaflet of the National Recreation Association for use by school teachers, guidance counselors, and recreation workers. It focuses on choosing a career in recreation at the same time that it suggests criteria for selecting a college whose curricula will be a preparation for such a career. "The broader and better your basic education, the greater are your chances for moving forward in the profession," applies equally well to the public health profession, as might many of the 13 specific questions the prospective recreation worker is advised to ask before selecting a college.

National Recreation Association, 315 4th Ave., New York 10, N. Y.

Sanitary Engineering Assistantships

Several half-time research assistantships in sanitary engineering and sanitary chemistry and biology are available at the School of Public Health, University of North Carolina. The assistantships are for a two-year period beginning September, 1954, during which time it will be possible to complete the curriculum for a master's degree, since the research assistants are

permitted to carry a half-course load. About 20 hours per week will be required to carry out the primary duties of the assistantship—prosecution of research work under faculty supervision. Summer full-time employment at an appropriate salary is possible.

Appointees must be eligible for admission to the Graduate School of the university. They may concentrate on sanitary engineering or sanitary science, including sanitary chemistry or biology.

The remuneration is $1,600 per academic year. The assistant pays his own tuition and fees for his half-course load—approximately $300 per year. Those eligible for veterans' benefits may receive the allowances permitted thereunder.

Applications, including information about undergraduate major and related experience, should be sent as early as possible to:

Department of Sanitary Engineering, School of Public Health, University of North Carolina, Chapel Hill.

Lean Year for Engineer Graduates

The total baccalaureate output of accredited engineering schools dips to 17,000, according to a recent Engineering News Record. This is reported to be the leanest year since 1946. In the face of a continuing annual demand for 30,000, it is estimated that there will be 20,000, 26,000, and 30,000 graduates, respectively, in the next three years.

Of the total number graduating in 1954, about 4,000 are civil engineers. Of these, about one-half go directly into the armed forces; about one-fourth already had jobs some months prior to graduation, leaving about 1,000 to go into teaching and graduate work, and to satisfy the demands of private industry, utilities, contractors, state and local government, and federal agencies. This small remainder "never had it so good" says the article. "Pressure is on them to take jobs at salaries about the same or sometimes a bit higher than last year's offers." And this, it must be remembered, is also the pool from which sanitary engineers are recruited.

Engineering News Record, April 22, 1954, McGraw-Hill, 330 West 42nd St., New York 36, N. Y.

Who Supports Graduate Students?

The National Science Foundation in its series of studies of the various phases of the nation's scientific activities, resources, and needs, is surveying the financial support available to graduate students. Information is being secured on the total number of graduate students taking advanced work leading to either master's or doctoral degrees, on the number of fellowship holders, the number of teaching and research assistantships, and the amounts and sources of funds. The number of applications for various classes of graduate support and the number of available places not filled are also being studied. The questionnaire is being sent to all heads of graduate departments in the natural and social sciences and the humanities of some 350 colleges and universities, after pretesting at George Washington University and the Universities of Indiana and Pennsylvania. The result is expected to provide accurate information on the potential number of highly trained personnel in relation to expanding research resources, shortages of scientific manpower, and recruitment of young scientists.

Finding More Medical Technologists

Increasing the 20,000 medical technologists registered with the Board of Registry of Medical Technologists to the 70,000 that could be used in all phases of medical scientific work in the United States is the aim of the newly

created National Committee for Careers in Medical Technology. The committee is sponsored by the American Society of Medical Technologists, the American Society of Clinical Pathologists, and the College of American Pathologists.

The new committee has received a grant of $30,000 from the American Cancer Society to produce a color movie for classrooms and group meetings and a black and white film for television. The National Cancer Institute is providing $15,000, among other uses to buy prints of the films for schools, educational guidance groups, science clubs, rural audiences, and television outlets. The color movie will have its initial showing in Washington, D. C., at the first American meeting of the International Congress of Clinical Pathology.

Chairman of the new committee is William O. Russell, M.D., of the American Society of Clinical Pathologists. Its headquarters are in the American Council of Education Building, Washington, D. C., and its executive secretary is Dallas Johnson.

Mental Health Research Fellowships

The National Institute of Mental Health announces the availability of postdoctorate and special research fellowships to scientists in the medical, biological, behavioral, or social science disciplines who wish to obtain further research training on clinical problems or on related problems in the basic scientific disciplines.

Candidates holding a Ph.D., M.D., or other equivalent degrees, who show evidence that they expect to follow a research career are eligible for the postdoctorate fellowships. The annual stipend is $3,400 plus $350 for each dependent. The one-year fellowship may be extended for an additional year with an increase of $300 in the stipend. The sponsoring institution may also receive a $500 supply grant in support of the Fellow's research.

The special research postdoctorate fellowships are available to candidates who have already proved their competence in research and who desire further specialized training. Stipends are determined on an individual basis by the Surgeon General of the Public Health Service.

Applications for these two types of fellowships may be submitted at any time and notification of results follows within three or four months. National Institutes of Health, Division of Research Grants, Research Fellowships Branch, Bethesda 14, Md.

Credit Lines

The Journal cannot furnish copies of items mentioned in Credit Lines. Please send requests to the addresses given.

Rehabilitating a Neighborhood

Let's Look at Housing, A Report on Housing Conditions in Selected Areas of Saint Louis provides invaluable data on which to establish a rehabilitation program for the entire city. The Housing Rehabilitation Coordinating Committee suggests that only the first step has been completed, but this detailed report answers the fundamental question on which the project was based: "Does anyone in your community now know with reasonable exactness which houses should be torn down and which neighborhoods can be preserved?" Any interested agency or individual in St. Louis can now know and future planning as well as immediate steps may be undertaken intelligently. Housing Rehabilitation Coordinating Committee, Room 412 City Hall, St. Louis 3, Mo.

A World Medical Journal

World Medical Journal began publication in 1954. The official Journal of the World Medical Association, it is printed in three languages — English, French, and Spanish. The first issue includes three scientific articles, each by a United States physician, and editorials, organization news, book reviews, news notes, and letters.

The Journal is published bimonthly in New York at the office of the association, 345 E. 46th St.; $5 per year, $1.50 per copy.

Local Health Department Recording

In an attempt to insure that local health department records might give maximum assistance in carrying out the broadened functions and activities of departments, the Public Health Service has published "Records and Reports of Local Health Departments."

In this pamphlet of nearly 100 pages are presented findings and recommendations on studies of recording systems used in 25 local health departments in eight states and on demonstration projects in two other departments. No indication is given, perhaps unfortunately, of the populations served by the separate departments and, except in one or two instances, of the type of jurisdiction—city, county, city-county, multicounty, or other district unit, whether urban or rural, and in what sections of the United States. It is to be presumed that the 27 represent an adequate cross-section of the varying types and problems.

Criteria for analysis of reports, the mechanics of record keeping, and how a report system is organized are each fully discussed. In addition, there are a bibliography and illustrative examples of record systems. An appendix outlines 10 principles governing service statistics in public health, the most important of which is that service statistics should serve one or more purposes, such as defining the community health program, measuring both its extent and its progress in relation to problems, serve as an aid to program planning, and provide data needed by the general public and other official bodies.

Olive G. Johnson, chief medical record librarian, Clinical Center, National Institutes of Health, is the author. PHS publication No. 285, Public Health Monograph No. 15. Gov. Ptg. Office, Washington 25, D. C.; 45 cents.

Clergymen and Health and Welfare

With the assistance of a Religious Advisory Committee representing the three chief faiths, the New York State Department of Health has published "A Clergyman's Guide to Health and Welfare Services in Official Agencies in New York State." Recognizing that clergymen as community leaders are consulted about a wide variety of problems, the booklet is an introduction to the health and welfare resources in official agencies in upstate New York.

A total of 34 different problems—adoption, aging, alcoholism, aid to group meetings, maternal and child health, mental health clinics, vocational rehabilitation, workmen's compensation, to mention only a few—are summarized with instructions as to what service is available. A directory of agencies makes the booklet very valuable. Child guidance clinics, veterans services, mental hospitals, as well as local health departments and welfare departments among numerous other services are listed.

In the preparation of the booklet the department's Office of Public Health Education had the advice of the Interdepartmental Health Council of New York State, made up of the health, welfare, mental hygiene, education, labor, and correction commissioners and chairmen of the Workmen's Compensation and Parole Boards.

New York State Department of Health, Albany, N. Y. Free distribution to upstate New York clergymen. No information as to other distribution.

75 Years of Connecticut

The Diamond Jubilee Issue of the Connecticut Health Bulletin for March, 1954, takes note of the 75th Anniversary of the State Board of Health. The Connecticut General Assembly in March, 1878, passed the act establishing the board, 73 years after local boards of health were authorized and 234 years after the Court of Election ordered the registration of births and marriages.

The State Board of Health became the present State Health Department in 1917 when the Public Health Council also was organized. This council was authorized to establish a sanitary code and to adopt amendments to keep pace with changing conditions and to conform with results of new research and experience. In 1939 the council began to approve local health officers and the same year the attorney general of the state issued an opinion that a health officer should be a licensed physician. Since that time all newly appointed local health officers have been physicians. As of June, 1953, each of the 152 health officers serving 180 towns except one were physicians. The exception was a doctor of veterinary surgery.

The jubilee issue includes a "chronological march of Connecticut Health Progress." One finds as early as 1917 a sanitary district law permitting the union of towns to form a district department of health. In 1939 an act authorized state aid for forming health districts; in 1947 increased state aid was authorized. However, at the end of 75 years the state had 180 city and town health departments, only 16 of them headed by a full-time medical officer.

"Provided health workers and the people at large take full advantage of present scientific knowledge and of the scientific discoveries that are bound to be made," it is prophesied that projecting Connecticut people on the 3-D screen in the next quarter century will show:

> Within each household a family of persons, of whatever ages and of whatever relation, where each has acceptance of friendliness of the others as they work and play together.
>
> Working conditions—both safe and pleasant in every way for men and women.

Clean waters and other natural resources freed from man-made wastes and devoted to man's enjoyment.

Fresh air to breathe and scenes to view free from smoke and haze—country living if you will—even in our industrial centers.

Persons, although living longer, able to get around, to be productive and be a comfort to all as they reminisce about "the good old days."

Fathers and mothers of school-age children exploring new fields of knowledge or creating works of art in their free time.

Families with young children and infants free from worrisome nights of illness.

Everyone throughout the four seasons able to be well and feel well, and have no friends or relatives with infectious diseases, these having been largely prevented through immunization and other medical controls, or cured early by prompt medical treatment.

That should be enough for one-quarter century for even the richest or next richest state in the Union.

Annual Reports

Annual Report of Public Health in Korea, 1953, "attempts to present an annual summary of public health activities in Korea for the calendar year 1953, while also attempting to give a review of the problems and developments of the past." In nearly a hundred pages there is presented the historical background of medicine in Korea, the preinvasion situation, the special problems of the war period, and the reconstruction developments. The report is by the Korean Civil Assistance Command, the chief of whose Public Health Branch is Colonel James M. Pappas, MC.

"A 75-Year Review, Cambridge Health Department" is also the current annual report. Today's activities are reported against the historical background of the department. Cambridge is said to have the fifth oldest Board of Health in the United States and the oldest in Massachusetts, antedating the Shattuck report by four years. However, the present report is based not on the earlier date, 1846, but on 1877 when the first "formal" Board of Health was established.

This report not only traces the growth of public health in Cambridge but epitomizes its development throughout the country generally.

It is interesting to note that although the Cambridge department has a formal history of 75 years and a less formal history of more than 100 years, it was not until the reorganization in 1950 that the first health commissioner, a full-time medical officer, was appointed.

"Leadership Against Tuberculosis, 1952–1953" is the annual report of Great Britain's National Association for the Prevention of Tuberculosis. It finds, as in this country also, that the tuberculosis death rate is constantly falling, the number of deaths having been cut nearly in half between 1938 and 1951. But, as in the United States also, the number of new cases is rising in England and Scotland, in the former by one-fifth between 1951 and 1952. In Scotland, the highest number of new cases in its history was reported. Improved methods of treatment, improved and early case finding are some of the answers. The report asks, "Have we done no more than convert the poignant tragedy of a premature death into the grim possibility of chronic illness? Does it mean that we are neglecting preventive measures? Tavistock House North, Tavistock Square, London, W.C. 1, England.

"Annual Report, 1952–1953" of the Arizona State Department of Health uses the technic of discussing each subject under three headings: This We Have Done; This We Need To Do; and This We Can Do If, following a brief statement of the problem—tuberculosis, venereal disease, chronic diseases, occupational health, etc. The "ifs" are

mostly in the realm of trained personnel, increased appropriations, and making maximum use of present-day facilities and knowledge. There is no glossing over the fact that the state has a high tuberculosis death rate and high infant and maternal mortality rates. A full-scale statistical supplement accompanies the report. C. C. Salsbury is the state health officer, Phoenix.

"For You and Your Neighbors" is a report of the New York City Department of Health for the years 1951 and 1952. It is an imaginative rather than primarily a statistical report and bears the mark of the health educator skilled in getting his message across. Excellent printing, large type, a good grade of paper, clear topical photographs, and above all readability, insure that the reader will go on to find out something about the "health services at his doorstep." Morey R. Fields, Ed.D., is director of the Bureau of Health Education which prepared the report.

"We Go to the People" is the annual report for 1952–1953 of the Connecticut Tuberculosis Association. Its title sets its tone, for this is a report not of what the association but of what the citizens of Connecticut, acting through their many groups and the association, did to achieve two basic goals—the finding, treatment, and rehabilitation of the tuberculous person and the protection of the well person against the disease.

The report has excellent design, printing, and photographs all calculated for easy readership by all who share in the association's activities.

The report was designed and written for the association by Yolande Lyon. Connecticut Tuberculosis Association, 43 Farmington Ave., Hartford 5.

"The Heart Story" is a 30-year accounting of the fight against diseases of the heart and blood vessels by the American Heart Association and the influences it generates in local communities. The report points out that the association's transition in 1948 from a professional organization to a national voluntary health agency made available larger funds for research.

During the association's life of 30 years, rehabilitation programs, clinic services, and other community programs have been developed. During that time also there has been, according to the report, a remarkable change of attitude by both physicians and the general public toward diseases of the heart—fear and fatalism have given way to a new determination to bring these diseases under control. The association has 56 affiliated socities, more than 350 chapter and heart fund campaigns in more than 3,000 communities.

The report is an excellent example of the art of printing and make up. American Heart Association, 44 East 23rd St., New York 10, N. Y.

"Alaska Department of Health: 13th Annual Report" indicates a per capita expenditure of $12.89 in fiscal 1953 for the nearly 129,000 inhabitants of the territory. Among the facilities provided there and not always found in continental United States are the marine units, three floating health centers, which, however, operated only three months and then were tied up because of budget limitations. In that period more than 4,500 persons were examined or given medical treatment and about 13,000 persons received chest x-rays. Among other units not always found is medical social service, mental health, nutrition, and a unit of chronic diseases of children.

The report, printed on a good grade of paper and well illustrated with charts, has special interest as a picture of public health in a territory that is applying for admission to statehood. C. Earl Albrecht, M.D., is territorial health officer.

Worth Acquiring

"The Room Upstairs" by Nora Stirling with a discussion guide by Nina Ridenour, Ph.D., is one of the American Theatre Wing Community Plays in a series on family life. Its theme is that older and younger people can live together amicably if each has understanding of the other. The play, running 40 minutes has a cast of five and requires no scenery and few props. It can be produced by any amateur group.

"The Room Upstairs" is designed as a group discussion starter on the typical problems that arise between older people and their children. Except in the New York metropolitan area, where production rights are reserved to the American Theatre Wing, the play is available for purchase and production from the publisher, Human Relations Aids, 1790 Broadway, New York 19, N. Y.; $1, $5 for a producing packet of six.

"Score Your Diet" is a score sheet for a quick scoring of the caloric, vitamin, protein, and other value of one's daily food intake. A table of recommended allowances is included. It emphasizes particularly the importance of diet in building a healthy child and can be used in day-to-day meal planning.

The authors are Laura Weyrick Hoeft, R.N., of the Bemidji, Minn., Crippled Children's Service, Miriam E. Lowenberg, Ph.D., of the Pennsylvania State College School of Home Economics, Mildred Mouw, R.N., of the University of Pittsburgh Graduate School of Public Health, and Dolores Nyhus of the California State Department of Health. Available from the Iowa State College Press, Press Building, Ames, Iowa; 35 cents with progressive reductions for quantities up to $18 per 100.

"An Audio-Visual Program in an Out-Patient Department" is a progress report of a three-year-old experiment in health education through the medium of motion pictures. These were shown to patients while they waited to see the doctor in the outpatient clinic of the Hospital for Joint Diseases, a general hospital in New York City with predominant medical services in orthopedic surgery. The program is a cooperative one between the hospital social service department and the health education staff of the Harlem Committee of the New York Tuberculosis and Health Association. General health subjects are included in the program.

The report is being made available as a guide for the future and to help others who may be planning similar programs. An essential part of the program are the questions of patients and discussion of the material shown. There are interesting case illustrations of what has come out of these discussions. New York Tuberculosis and Health Association, 386 Fourth Ave., New York 16. Single copies free; 20 cents in quantity outside New York City.

"Narcotics: The Churches and the Problem of Narcotic Education" is a revision of a pamphlet first published in 1952. Made up of two parts, it includes a brief informative statement and an official statement of the National Council of Churches on the problem of drug addiction. Churches are asked to give support to increased governmental action at all levels in drying up the sources of narcotic supply, establishment of treatment centers for specialized care, supplemented by supervised aftercare, and an effective educational program to reach young people and their parents, pastors, teachers, and community leaders. It points out the church's re-

sponsibility to interpret the narcotic problem "as symptomatic of deep social, emotional, and religious disturbance. This comes as a climax to a disturbed period of history characterized by the tensions incident to recurrent wars, depression, and social pressures." The author is Paul L. Tilden, associate executive director of the Department of Pastoral Services and Social Welfare, National Council of Churches of Christ in the U.S.A. 120 East 23rd St., New York 10, N. Y.; 20 cents.

"Breakfast in the Modern Reducing Diet" by the Cereal Institute, a 24-page booklet, features the importance of the cereal and milk serving. This is a timely tie-in with the weight control program. Cereal Institute, 135 South La Salle St., Chicago 3, Ill.; free.

"TB: A Community Health Problem" by the Queensboro (New York City) Tuberculosis and Health Association is built on Sir William Osler's text, "The battle against tuberculosis is not a doctor's affair; it belongs to the entire public." Thus, it is an attempt to help the "man on the street" understand what tuberculosis is, where it thrives, and particularly that the sufferer from it can be cured and returned to normal work and living. It is well written and pictorially illustrated for its purpose of health education of the layman. Queensboro Tuberculosis and Health Association, 159-29 90th Ave., Jamaica 32, N. Y. No information as to distribution outside of Queens County or Borough.

"Georgia Hospital Diet Manual" is an example of cooperative effort of several voluntary agencies and a state department of health, in this case Georgia. Associated in the venture also were the Medical Association of Georgia and the Georgia and Atlanta Dietetic Associations.

The manual, designed primarily for use in the smaller hospitals of Georgia, outlines diets as general guides to be adjusted to individual needs as directed by the physician. The regular diet included meets the normal nutritional requirements recommended by the Food and Nutrition Board of the National Research Council. Division of Hospital Services, Georgia Department of Public Health, Atlanta 3; $1. Quantity limited.

"Board Members Against TB," "a guide to board membership in the voluntary tuberculosis movement," might equally well serve as a guide to board membership in other voluntary health agencies. There is a short background chapter on the current status of tuberculosis, what the basic measures for controlling it are, how citizens participate in its control, what the board member can and does do, and how strong local tuberculosis associations are built. National Tuberculosis Association, 1790 Broadway, New York 19.

Books and Reports

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

The National Health Service in Great Britain—By James Stirling Ross. New York: Oxford University Press (114 Fifth Avenue), 1952. 393 pp. Price, $7.00.

This relatively brief volume contains an authoritative and compact history and description of Britain's National Health Service. It is of importance to American readers because it is both readable and "the standard text." The author's long background of high level service to the state, including his role as a regional officer of the Ministry of Health during the critical years of organization and initiation of the Service, provides the basis for the generally administrative orientation of this essentially historical work.

The first two sections, devoted to a general discussion of the National Health Service and a history of its antecedents, are of particular usefulness. An understanding of this background, different in so many ways from the evolution of health services in our own country, is essential for an appreciation of the current picture of those services in England and Scotland. The American audience might possibly need some further historical background on the general practitioner and his relations with the specialist and with the hospital.

The major portions of the text cover the history of the planning and organizational phases of the Service with an excellent, though brief, description of the operations of each of the major aspects of the program. There is a separate chapter on the Service in Scotland to make clear the differences between the two systems. These sections, as well as the concluding discussion of the future and its problems, are presented with brevity and clarity. The author is straightforward in his description, offering the major viewpoints as they arose concerning issues and problems. His explanation of cost estimates and expenditures is simple and lucid. It is our feeling that the problems relating to the integration of public health practice and clinical medicine, as well as those of dental care, particularly for children, tend to be understated.

Generally speaking, this is the best brief text on the history, organization, and administration of the British National Health Service. It will serve as a major teaching and reference source for interested health and social science professionals for some time to come.

JONAS N. MULLER

Distribution of Health Services in the Structure of State Government—By Aaron W. Christensen, Evelyn Flook, and Georgie B. Druzina. Public Health Service Publication 184, Part Three. Washington, D. C.: Gov. Ptg. Office, 1953. 277 pp. Price, $.65.

This is the third part of Public Health Service Publication 184. It deals with personal health services provided by state government. Part one dealt with the over-all pattern of state organization. Part two depicts the general services, such as public health nursing and health education and provisions of construction of hospitals and other health facilities. Part four will describe environmental health and safety services.

This volume deals with the control of the communicable diseases and specific disease programs, such as cancer, heart, and diabetes, with maternal and child health, mental and dental health services, with medical services for general

illness and disabilities, and miscellaneous services, such as those to the blind, for migrants, and activities concerning blood and the hygiene of aging. No evaluation is attempted, as this study is purely descriptive in its purpose. It includes brief histories of the development of the programs, including relevant voluntary agencies and a comparison with services provided in 1940.

This series of volumes is of basic importance to all serious students of health services in this country. It provides in compact form with brief, stimulating and interestingly written text, a comprehensive picture of the extent, type, and dispersion of health services in state government. This volume is of special interest in outlining the extent and direction of change in health services. Increasing dispersion is emphasized by the mental health services, where not only is it greater than it was 10 years ago, "but is more widespread than might reasonably be considered consistent with efficient operation."

Diabetes control services provide an interesting index to the extension and variety of activities in the chronic disease field, as well as a valuable lesson in the many different approaches to such a problem. ROSCOE P. KANDLE

Housing an Aging Population—By the Committee on the Hygiene of Housing, American Public Health Association. New York: American Public Health Association (1790 Broadway), 1953. 92 pp. Price, $1.00.

This bulletin contains three major sections devoted to The Problem, Attempts to Solve the Problem, and Guiding Policies. An appendix summarizes some attempts of the Scandinavian countries and England to provide better housing for older people. An eight-page bibliography covers more of the field of gerontology than it does the subject of housing. This bulletin will have a useful place in the libraries of the many people who must concern themselves with housing and the over-all problems of older people. The sections dealing with foreign nations are especially useful but need extension to broader areas, such as Switzerland where an excellent system is in operation not only for housing the aged but also for providing them with a system of medical service that is satisfactory to both the patient and physician.

For those familiar with the field of gerontology this bulletin will contain little that is new and much that is hackneyed and trite. The threadbare jargon of sociology, "the aged are not abstractions but fully individualized persons," makes the bulletin tedious reading for those who desire facts to help them improve the housing of the aged. The bulletin is very skimpy in discussing current American advances, such as trailer camps, "Moosehaven," and activities similar to those of Mr. Penny. It gives scant attention to American housing in mental hospitals, county homes, and other institutions. The bulletin would have been far more useful if it had been broadened into greater coverage concerning housing with less space devoted to obvious or well known gerontology.

CLIVE M. MCCAY

Nutrition in Health and Disease—By Lenna F. Cooper, Edith M. Barber, Helen S. Mitchell, and Henderika J. Rynbergen (12th ed.). Philadelphia, Pa.: Lippincott (East Washington Square), 1953. 790 pp. Price, $4.50.

That this book was first copyrighted in 1928 and has had 12 editions is evidence of its value. The organization of the book into four sections dealing with normal nutrition, diet therapy, food preparation, tabular material and special tests has been retained from earlier editions, as has the excellent quality of type and double column type-

setting. Paper and binding are serviceable. Because of the amount of material included, the writing necessarily eliminates most descriptive detail. However, well chosen lists of references are included for the curious reader and the excellent paragraphing, subject headings, graphs, and illustrations serve to make the book easily used.

The entire 12th edition has been brought up to date. Several sections were rewritten. The method of calculating calories adopted by FAO in 1947 and incorporated into Handbook 8, U. S. Department of Agriculture, is included. The chapter on obesity has been rewritten and additional materials on diets of varying cholesterol and sodium concentrations included. The importance of management in the feeding of infants has been stressed in the rewriting of the chapters on feeding both the well and the ill infant.

This book should retain its place as a text in the nursing school. It also provides a valuable tool in college teaching and a reference for the lay leader.

MARGARET A. OHLSON

The Role of Voluntary Agencies in Technical Assistance—New York: American Council of Voluntary Agencies for Foreign Service, Inc. (20 West 40th St.), 1953. 176 pp. Price, $1.00.

At a time when widespread and very significant technical assistance activities are being sponsored and carried out by individual governments, such as the United States, as well as by international organizations, such as the WHO and PASB, it is easy to overlook the contributions of the many voluntary agencies active in this field. As so often has been the case, their programs have represented the true pioneering and demonstration of the value and practicality of this type of approach to human advancement and the development of cooperation and good will among the peoples of the world.

This book is one result of a study made by the Committee on Technical Assistance and Projects of the American Council of Voluntary Agencies. In the face of the extensive entry into the field by official agencies, the study was authorized for the purpose of "exploring the continuing role of American voluntary effort in the field of technical assistance." The list of members of the study committee, the working groups which dealt with various substantive fields and geographic areas, and of the resource persons is impressive from the standpoints of breadth of representation and quality of individuals. In relatively few but effective words there is presented a picture of the needs for technical assistance, especially in agriculture, health, and education throughout the world; the problems that must be overcome in the development and operation of such programs; the places where the voluntary agencies have, are, and may continue to make a real contribution; and the areas in which and methods whereby the voluntary and official agencies may augment each other. Throughout these succinct discussions, many readable and appropriate examples are given. The book is a must for all those involved or interested in the field of technical assistance, international relationships, and the broader aspects of sociology.

JOHN J. HANLON

The Church and Mental Health—Edited by Paul B. Maves. New York: Scribner's (597 Fifth Avenue), 1953. 287 pp. Price, $4.00.

This book grew out of discussions among staff and members of the Department of Pastoral Services of the Federal Council of Churches of Christ in America—now part of the National Council of Churches of Christ in the

United States of America. It is a compilation of chapters written by 14 eminent contributors—psychiatrists, theologians, educators, and pastors. Consideration of the qualifications of the authors and the subjects of the section and chapter headings will convince those who believe that the church can and does play an important part in fostering mental health that they want to read and learn what these distinguished psychiatrists and divines have written of their thinking together.

The book stresses the need for all workers in the field of mental or psychic health to realize the importance of religion in human wholeness. It shows the earnest desire of teachers of theological students, as well as of ministers in their pastoral services, for more understanding, more knowledge, and more ability to develop and call into action the skills which will help individuals and congregations toward mental health. It considers the conflicts and confusions arising in individuals from disagreement with stated beliefs of the church, from unacceptable interpretations or misinterpretations of church traditions, forms, and values. It presents the desirability of psychiatrist and minister working together to help resolve such conflicts.

This volume will undoubtedly stimulate further writing. With its excellent bibliography it will induce more reading and more profound thinking on the part of workers in the mental health field, about man's need for wholeness—spiritual, mental, physical—and about cooperative ministration toward that end.

ALTA E. DINES

Standard Methods for the Examination of Dairy Products (10th ed.). New York: American Public Health Association (1790 Broadway), 1953. 345 pp. Price, $4.75.

All persons concerned with bacteriological and chemical analyses of milk, particularly those engaged in regulatory and quality control work, should be fully informed of the methods outlined in this book. The mutual interests of regulatory agencies and industry will best be met by strict adherence to these methods.

The first chapter contains a discussion on the selection, application, and interpretation of the various quality tests. Although this discussion assists administrators in the application of mandatory and optional tests, the technician will also find this material of importance in applying the proper technic to the various tests. The remaining 11 chapters deal with specific procedures for the examination of dairy products.

Some of the outstanding changes adopted in this edition are: two milk-free plating media which replace the former milk-containing media; recognition of a syringe-pipette for measurement of 0.01 ml. volumes of milk and cream; substitution of improved staining methods in the direct microscopic count; phosphatase tests are changed to those of Sharer (copper sulfate, 1952 modification) and Sanders and Sager; improved sediment tests for milk. There are many additional changes of less prominence but probably of equal importance.

Although some of the discussions may appear abbreviated, very little of importance has been omitted, and further information may be obtained by the reader from the extensive bibliographies provided at the end of each chapter.

MARVIN L. SPECK

The People's Health. A History of Public Health in Minnesota to 1948—By Philip D. Jordan. St. Paul, Minn.: Minnesota Historical Society, 1953. 524 pp. Price, $5.00.

Good local history has been prominent by its absence in the public health field. All the more reason therefore to welcome enthusiastically such a splendid

example of the genre as Dr. Jordan has provided for us. In the pages of this informal history are recorded the beginnings and development of public health in Minnesota from the middle of the nineteenth century to 1948. The emphasis is on the social aspects of this process and on the roles that individuals as well as organizations have played in it.

It is worth while noting that the author is a professional historian with a long-standing interest in social history as well as in the history of medicine. This background is reflected in his presentation of the evaluation of public health in Minnesota. It is a story which begins with the period when the chief concern of public health workers was to combat dreaded outbreaks of smallpox, diphtheria, scarlet fever, and typhoid, and continues to the present multifaceted program.

The first five chapters of this volume are devoted to the establishment of the State Board of Health in Minnesota, dealing particularly with the role of Charles N. Hewitt, the first secretary to the board. In passing, it may be mentioned that the Minnesota board is the fourth oldest in the country. In succeeding chapters Dr. Jordan then deals with the struggle for sanitary sewage disposal, the fight for pure food and water, the growth of programs for maternal and child health, for the control of tuberculosis and venereal disease and, more recently, the efforts to deal with mental disease and chronic illness. In his final chapter the author discusses these trends in the light of tomorrow's health.

This book will interest public health workers and students who plan careers in the public health field. It is of vital concern, however, to all citizens interested in community health and it is hoped that Dr. Jordan will have many readers.

GEORGE ROSEN

Biochemistry and Physiology of Nutrition—Edited by Geoffrey H. Bourne and George W. Kidder. New York: Academic Press (125 East 23rd St.), 1953. Volume I, 569 pp. Price, $13.00. Volume II, 641 pp. Price, $15.00.

This is a modern, comprehensive book written by specialists and directed to all workers dealing with problems of metabolism as well as to nutritionists. Much space is given to enzymes, coenzymes, and the particulars of intermediary metabolism, since the editors believe that "basic metabolic functions have assumed a definite and indispensable place in the science of nutrition." But other subjects are also included: the major nutritional components; intracellular localization of enzymes and vitamins; structural tissue changes in vitamin deficiency; the relations of vitamins to hematopoiesis; and historical considerations.

Scientific knowledge is now developing at such a rapid pace that the modern reference book must usually, as is the case here, represent the efforts of several experienced investigators, each of whom reviews the field of his competence. The result presented in these two volumes is a happy one; each chapter contains a well rounded presentation of its subject, up to date, and replete with references (as many as 300–700 references in the case of some); and the editors seem to have largely avoided the repetitions and omissions which can easily occur in such a collaborative effort. Thus, the reviewer found that, with the help of the chapter headings and the complete indexes, he could rather easily follow the story of a subject such as cocarboxylase which cuts across several chapters.

The interested reader will want to know the subjects covered in the 21 chapters. Volume I includes the early development of the science of nutrition;

the history of vitamins; water and electrolyte metabolism; carbohydrate metabolism; amino acids; the biosynthesis of proteins; lipid metabolism; the fat-soluble vitamins; vitamin B complex; vitamins and hematopoiesis; and vitamin C. Volume II continues with the structural changes in vitamin deficiency; the intracellular localization of enzymes and vitamins; the microbiology of digestion; the nutrition of invertebrate animals; energetics and metabolic function; hydrolytic and phosphorolytic enzymes; the respiratory enzymes; the coenzymes; iron metabolism; calcium and phosphorus metabolism; the trace elements; and a chapter on application to human nutrition. Each volume has a complete index.

A further point of interest is the fact that the two volumes are an Anglo-American effort. One editor is British, the other American, and 12 of the chapters are written by workers in the British Empire, while 11 were produced by American authors.

A. HUGHES BRYAN

Diabetic Care in Pictures—By Helen Rosenthal and Joseph Rosenthal (2nd ed.). Philadelphia: Lippincott (East Washington Sq.), 1953. 164 pp. Price, $3.00.

Much of the health and happiness of the diabetic patient is dependent on the patient's acceptance and knowledge of his condition. "Diabetic Care in Pictures" is designed for the patient, to help him understand and to give him the know-how for his personal care.

It is a good book, generously illustrated, covering, as the chapter titles indicate: Diabetes, Diets (with various food charts), Insulin, Insulin Reactions, Blood and Sugar Tests, Skin Injuries and Infections, Personal Hygiene (from eyes to feet!), and Personal and Social Factors.

Full use of the book, especially the food sections, requires an intelligent patient, one able and willing to study it out. Perhaps, the book should give more emphasis on the importance of the patient keeping under medical supervision. A patient learning to manage his diet, the technics of insulin injection, and urine testing might feel overly self-sufficient.

Alcohol method of syringe sterilization is described and illustrated in detail. Other methods are alluded to only following a statement that alcohol may cause inflammation at site of injection: "under such circumstances some other means of sterilization should be employed."

The book should prove useful to diabetics and to nurses or others teaching the care of the diabetic patient.

THEODORA SHARROCKS

The Sardinian Project: An Experiment in the Eradication of an Indigenous Malarious Vector—By John A. Logan with the collaboration of Thomas H. G. Aitken; Guide V. Casini; Frederick W. Knipe; John Maier; and Athol J. Patterson. The American Journal of Hygiene Monographic Series No. 20. Baltimore, Md.: Johns Hopkins Press, 1953. 415 pp. Price, $7.50.

This is a most interesting and enlightening account of one of the really stalwart mosquito elmination efforts of the century made by a special agency of the Italian High Commission for Hygiene and Public Health and financed by the United Nations Relief and Rehabilitation Administration, the Economic Cooperation Administration, and the Rockefeller Foundation. It is unique among its kind as it involved a species, Anopheles labranchiae, believed to be indigenous and, therefore, it is argued, better adjusted to its environment and more difficult to dislodge than were the introduced A. gambiae from Brazil and Egypt, and Aedes aegypti from various parts of South America. At any rate,

in spite of painstaking antilarval and antiadult measures against this malaria vector, the five-year, multimillion dollar campaign was biologically unsuccessful—A. labranchiae remains entrenched in Sardinia—but as a public health and bonification project it was supremely successful. Malaria disappeared completely and considerable areas of new farm land were made available as a result of ditching and drainage.

The essential story of the campaign is told in Chapter II, "The Campaign," and a forthright evaluation of various influences and circumstances concerned is given in Chapter X, "Critical Review." Special aspects of the undertaking—historical, procedural, entomologic, technologic, epidemiologic, administrative, quarantine, antihousefly, taxonomic, ecologic, fiscal, personnel, and final recommendations to the Italian government—are treated in more or less detail in the eight other chapters and seven appendixes. The text is bountifully supplemented by excellent photographs, figures, and tables.

Perhaps the most remarkable feature of this scientific report is the resolute determination of the authors to examine and appraise impersonally their plans, activities, and results in order to expose their faults and shortcomings. Thus, this record reveals serious deficits in knowledge and technics which should stimulate investigation and development.

The volume will be of compelling interest to the fundamental biologist, the malariologist, the medical entomologist, the insect-control engineer, the health administrator, and many others.

JUSTIN M. ANDREWS

Salmonellae and Shigellae—By Alfred J. Weil and Ivan Saphra. Springfield, Ill.: Thomas (301 East Lawrence Ave.), 1953. 247 pp. Price, $7.75.

In 15 chapters the Salmonellae and Shigellae are very thoroughly described and discussed from every standpoint: definitions of the family Enterobacteriaceae and of its genera and species related to the subject at hand; taxonomy; antigenic structures and serological studies and their ramifications; phases and phase variation; Kauffmann-White schema; use and interpretation of the Widal test in its most modern form; coproantibodies; food poisoning; clinical features; antibiotic-sensitivity testing, epidemiology; and many other topics. The discussions are on an expert level for the informed reader, but are not too technical and are clear and concise. Most of the book is, naturally, devoted to complete and detailed discussions of antigenic structures and serological methods. The cultural and biochemical methods, which are only briefly discussed, are standard procedures and require little comment. The book contains 14 illustrations of various colony forms, cultural reactions (as on TSI agar, in color), agglutinations, etc. There are 35 tables of cultural and serological reactions, Kauffmann-White schema, etc. There are nearly 300 references and an index. The brochure is well manufactured, but it is hoped another edition will be more carefully proofread by the authors and printer. Every worker whose field touches the Enterobacteriaceae at any facet will find this book a necessary reference and an invaluable source of authoritative information. MARTIN FROBISHER

Community Organization for Neighborhood Development—Past and Present—By Sidney Dillick. New York: Womans Press and William Marrow and Co. (425 Fourth Ave.), 1953. 197 pp. Price, $4.00.

Here is an important book which presents a comprehensive history of neighborhood organization. Against the background of the industrial revolution in the United States it traces the development of charity organization, of

the "friendly visitor," of schools as a center of neighborhood life, of the influence of the early public health projects, and of community councils. The objectives, organization, and evidence of success or failure of experiments and demonstrations, such as the Henry Street Settlement and East Harlem Health Center of New York, South End House of Boston, Pittsburgh's Community Councils, defense council organizations of World Wars I and II, and many others are analyzed.

The reader gets a perspective of community organization from this concise and well written short volume which no person working with health councils or local health services can afford to overlook. The influences of the early slums, the depression, the early health programs, the growing concepts of family welfare and concern for all children, rather than only the poor, are well presented.

It is clear that most of the modern ideas and activities in community organization were clearly enunciated many years earlier and that there has been much experimentation about which the present workers must know in order to avoid making the old errors over again. However, the basic job of really making urban neighborhood, district and decentralized services, and community organization as effective as they could be, remains to be done. This book will help. Do not miss it.

ROSCOE P. KANDLE

Books Received

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

BRITISH MEDICAL BULLETIN. REACTIONS TO INJURY. Vol. 10, No. 1, 1954. New York: Oxford University Press, 1954. 72 pp. Price, $2.75.

BUILDING THE BOARD. Harleigh Trecher. New York: National Publicity Council for Health and Welfare Services, 1954. 109 pp. Price, $2.00.

CLIFF'S EDGE, THE. Marie Hackett. New York: McGraw-Hill, 1954. 245 pp. Price, $3.50.

COHORT FERTILITY. NATIVE WHITE WOMEN IN THE UNITED STATES. Pascal K. Whelpton. Princeton, N. J.: Princeton University Press, 1954. 492 pp. Price, $6.00.

DEMOGRAPHIC YEARBOOK 1953. United Nations. New York: Columbia University Press, 1953. 441 pp. Price, $6.50 cloth, $5.00 paper.

DISTRIBUTION OF HEALTH SERVICES IN THE STRUCTURE OF STATE GOVERNMENT 1950. Part 4. Aaron W. Christensen, Evelyn Flook, and Rubye F. Mullins. U. S. Department of Health, Education and Welfare. Washington, D. C.: Gov. Ptg. Office, 1953, pp. 279–360. Price, $.50.

FIRST AID AND RESUSCITATION. Carl B. Young, Jr. Springfield, Ill.: Thomas, 1954. 238 pp. Price, $8.50.

GERIATRIC MEDICINE. Edward J. Stieglitz (3rd ed.). Philadelphia, Pa.: Lippincott, 1954. 718 pp. Price, $15.00.

GESUNDHEIT DURCH KRANKHEIT DAS RATSEL DER IMMUNITAT (Health by Sickness—The Problem of Immunity). Hans-Joachim Flechtner. Dusseldorf, Germany: Econ-Verlag, GMBH, 1954. 352 pp. Price, DM 14,80.

GUIDE LINES FOR GROUP LEADERS—THE WHY AND HOW OF GROUP WORK. Janet P. Murray and Clyde E. Murray. New York: William Morrow, 1954. 224 pp. Price, $3.95.

GUIDE TO STANDARDS FOR RESIDENT CAMPS FOR CRIPPLED CHILDREN. Chicago, Ill.: National Society for Crippled Children and Adults, 1954. 31 pp. Price, $1.50.

HEALTH AND SAFETY FOR YOU. Grace T.

Hallock, Ross L. Allen, and Eleanor Thomas. Boston, Mass.: Ginn, 1954. 192 pp. Price, $1.60.

HEATING VENTILATING AIR CONDITIONING GUIDE 1954. Vol. 32. New York: American Society of Heating and Ventilating Engineers, 1954. 1616 pp. Price, $10.00.

HOW TO HELP OLDER PEOPLE. Julietta K. Arthur. Philadelphia, Pa.: Lippincott, 1954. 487 pp. Price, $4.95.

IMPROVEMENT OF PATIENT CARE, THE. A STUDY AT HARPER HOSPITAL. Marion J. Wright. New York: Putnam's, 1954. 236 pp. Price, $5.50.

JULY 1953 PROPHYLAXIS PROGRAM FOR POLIOMYELITIS IN CHEMUNG AND STEUBEN COUNTIES OF NEW YORK STATE, THE. A SOCIOLOGICAL DESCRIPTION. Walter E. Boek. Albany, N. Y.: State Department of Health, 1954. 55 pp.

LABORATORY INSTRUMENTS—THEIR DESIGN AND APPLICATION. A. Elliott and J. Home Dickson. New York: Chemical Publishing, 1953. 414 pp. Price, $7.50.

LETTERS TO MY DAUGHTER. Dagobert D. Runes. New York: Philosophical Library, 1954. 131 pp. Price, $2.50.

LUNG CANCER. Seymour M. Farber. Springfield, Ill.: Thomas, 1954. 157 pp. Price, $4.75.

MANAGEMENT AND UNION HEALTH AND MEDICAL PROGRAM. Margaret C. Klem and Margaret F. McKiever. U. S. Department of Health, Education and Welfare. Washington, D. C.: Gov. Ptg. Office, 1953. 276 pp. Price, $1.00.

MANUAL FOR CANCER PROGRAMS. BASED ON THE MINIMUM REQUIREMENTS FOR APPROVAL OF A CANCER PROGRAM. Approved by the Committee on Cancer, American College of Surgeons. Chicago, Ill.: American College of Surgeons, 1953. 38 pp.

MATERIAL ON HOME ECONOMICS AND ITS TEACHING. Edited by the Home Economics Information Exchange, Nutrition Division. Rome, Italy: Food and Agriculture Organization of the United Nations, 1953. 153 pp. Price, $.50.

NATIONAL FAMILY SURVEY OF MEDICAL COSTS AND VOLUNTARY HEALTH INSURANCE. PRELIMINARY REPORT. Odin W. Anderson. New York: Health Information Foundation, 1954. 80 pp.

NEWER CONCEPTS OF THE CAUSES AND TREATMENT OF DIABETES MELLITUS. Proceedings of the Symposium on Diabetes Sponsored by the New York Diabetes Association, Memorial Hospital and The New York Academy of Sciences, New York City, October 8, 1953. New York: National Vitamin Foundation, 1954. 181 pp. Price, $2.50.

PSYCHOLOGY OF THE CRIMINAL ACT AND PUNISHMENT. Gregory Zilboorg. New York: Harcourt, Brace, 1954. 141 pp. Price, $3.50.

PUBLIC HEALTH INSPECTOR'S HANDBOOK. Henry H. Clay and Ronald Williams (8th ed.). London: H. K. Lewis, 1954. 608 pp. Price, 30s. net.

SONG OF LIFE WITH VARIATIONS. H. Ameroy Hartwell. Boston, Mass.: Bruce Humphries, 1953. 371 pp. Price, $5.00.

SCIENCE BOOK OF WONDER DRUGS. Donald G. Cooley. New York: Franklin Watts, 1954. 247 pp. Price, $2.95.

SOCIAL SERVICE AND THE STANDARDS OF LIVING. Proceedings of the Sixth International Conference of Social Work, Madras, India, December 1952. New York: U. S. Committee of the International Conference of Social Work, 1952. 354 pp. Price, $3.00 to members of conference, $4.00 to nonmembers.

SYMPOSIUM ON PROTEIN METABOLISM. Proceedings of the Nutrition Symposium held at the University of Toronto, Toronto, Ontario, Canada, October 30, 1953. A. E. Axelrod, et al. New York: National Vitamin Foundation, 1954. 107 pp. Price, $1.50.

SYMPOSIUM ON LIGHT MICROSCOPY. 57th Annual Meeting, American Society for Testing Materials, New York, N. Y., June 25, 1952. Philadelphia, Pa.: American Society for Testing Materials, 1953. 126 pp. Price, $2.50.

TECHNIQUES OF TUBERCULIN TESTING AND BCG VACCINATION. Public Health Service Publication No. 182. Washington, D. C.: Gov. Ptg. Office, 1953. 44 pp. Price, $.55.

VITAMINS, THE. Vol. I. CHEMISTRY, PHYSIOLOGY, PATHOLOGY. W. H. Sebrell, Jr., and Robert S. Harris. New York: Academic Press, 1954. 676 pp. Price, $16.50.

WAY TO THE SOUL OF THE MENTALLY ILL, A. Gertrud Schwing. New York: International Universities Press, 1954. 157 pp. Price, $3.00.

WINE AS FOOD AND MEDICINE. Salvatore P. Lucia. New York: Blakiston, 1954. 149 pp. Price, $3.00.

A Selected Public Health Bibliography with Annotations

Grim Statistic — The (New York State) Department of Mental Hygiene carries approximately 120,000 patients on its books, employs more than a third of all governmental workers, and accounts for one-third of the annual budget. Though half the patients admitted last year were discharged before the year was ended, the total patient load increased by 3,000.

Brussell, J. A. History of the New York State Department of Mental Hygiene. New York State J. Med. 54, 6:822 (Mar.), 1954.

Bitter Truth?—Reluctantly accepting the assumption that essential malignancy exercises the overwhelming effect on the prognoses of cancer, this (British) paper ends with the rhetorical questions: "Are our transatlantic colleagues (Canadian), with their passion for brevity and clarity, right in saying, 'To no small extent the doctrine of synonymy of early treatment and curability should be recognized for the shibboleth which it is'?"

Curnow, R. N. Health Education—Cancer. Pub. Health 67, 7:112 (Apr.), 1954.

Macabre Prognostication—If cancer deaths and life expectancy both continue to increase at past rates, more than one in three of the children now being born may expect to develop cancer, these biometricians warn.

Cutler, S. J., and Haenszel, W. N. The Magnitude of the Cancer Problems. Pub. Health Rep. 69, 4:333 (Apr.), 1954.

Salvarsan's Inventor — As a memorial on the hundredth anniversary of his birth, three people who knew Paul Ehrlich offer some interesting reminiscences of that brilliant research chemist who fastened the "side-chain" theory about the necks of struggling generations of students of bacteriology. For good measure a paper on Emil von Behring is added.

Dale, H., et al. Paul Ehrlich (and three related papers). Brit. M. J. 4863:659 (Mar. 20), 1954.

Rolla E. Dyer Lecture — This observant essayist resurrects the gold-headed cane—that ancient symbol of the pompous, wise-in-the-ways-of-man physician of the 18th century—and adroitly twists the symbol about to prod at the single-track-minded technology of the 20th century laboratory researcher.

Dubos, R. J. The Gold-Headed Cane in the Laboratory. Pub. Health Rep. 69, 4:365 (Apr.), 1954.

About Summer Complaint—Anyone who possesses even a small yen for the historic will like this account of the flounderings of the pediatric teachers of the 19th century. The diminishing few among us who were born then and have survived the bizarre ideas of infant feeding will read this recital with varied emotions.

Jefferson, D. L. Child Feeding in the United States in the Nineteenth Century. J. Am. Dietet. A. 30, 4:335 (Apr.), 1954.

A Matter of Guidance — Two groups of new sanitizing agents have great assets for the food industry—one to clean utensils, the other to clean hands. Their values depend upon understanding application, and practical recommendations are made here about improving that all-essential understanding.

Korff, F. A. Germicidal Soaps—A New Ally in Sanitation. Modern San. 6, 3:30 (Mar.), 1954.

Quackery in Weight Reduction—Massage, steam baths, calisthenics, and the like make one feel good but they remove no surplus fat permanently. Intelligent and sustained calorie counting will.

KRUSEN, F. H. Physical Medicine vs. Dieting for Obesity. Am. J. Nursing 54, 4:451 (Apr.), 1954.

Uncomfortable Reading — Another of those imposing arrays of statistics that make it doubly difficult to assume that smoking has nothing to do with the phenomenal increase in cancer of the lungs. The writer warns that even if the unlikely should happen and people were persuaded to stop smoking, so many people have smoked so long and so steadily that no appreciable drop in lung cancer rates could be anticipated in another decade.

LEVIN, M. L. Etiology of Lung Cancer: Present Status. New York State J. Med. 54, 6:769 (Nov. 15), 1953.

Boot-Strap Levitation—Group discussions by parents of chronically sick children offer opportunity for more complete information, greater possibility of acceptance, ability to see problems as common ones, and better relations with professional workers.

LUZZATTI, L., and DITTMANN, B. Group Discussions with Parents of Ill Children. Pediatrics 13, 3:269 (Mar.), 1954.

About Uninhabitable Houses — "This address gives a short review in general terms of child health in the last hundred years." So begins an absorbing story of the struggle for a sanitary environment in Scotland—one full of revealing detail, to delight the historically minded reader.

MCNEIL, C. Yesterday and Tomorrow in Child Health. Brit. M. J. 4861:533 (Mar. 6), 1954.

"Prophylactic Geriatrics" — A doctor, himself getting along in years, relates his long experience following a determination to have a "personal physician" of his own—and to try to be a good patient. He testifies here to the various ways his physician has, through the years, contributed to the good health that the patient has enjoyed.

MEANS, J. H. Role of the Generalist in Modern Medicine. Am. Pract. 5, 3:169 (Mar.), 1954.

"Mother-Nursing" — From the summary of a (New Zealand) paper come these fragments: "Cross-infections among children in hospitals are still ripe. A system of mother-nursing . . . has been rigidly used for the past eleven years. Each mother and child occupy a small private room. The psychological benefit to an infant . . . is great. Last year there was no case of cross-infection."

PICKERILL, C. M., and PICKERILL, H. P. Elimination of Hospital Cross-Infection in Children. Lancet 266, 6809:4215 (Feb. 27), 1954.

Town House — Well worth the trouble of hunting it out is this paper, if only to picture the ways "socialist" England tackles a health nuisance. The owner of a substandard lodging house would not agree to make it either sanitary or safe, so the town bought it, made it fit to live in, and turned it over to the Salvation Army to manage—to the satisfaction of all, it is alleged.

O'BRIEN, G. The Acquisition and Improvement of a Common Lodging-House in St. Helens. J. Roy San. Inst. 74, 3:189 (Mar.), 1954.

New Jobs — New Tools — Local public health officials and physicians face the same dilemma—they have the means to deal with conditions that are progressively decreasing; for the conditions progressively becoming more grave the means at their disposal leave much to be desired. The research pro-

gram of the Public Health Service's imposing Clinical Centers and Institutes is aimed to correct these deficiencies.

SCHEELE, L. A. The Clinical Center of the Public Health Service. GP 9, 4:93 (Apr.), 1954.

Why Fish Spoil — Anyone whose job has to do in any way, however remote, with the marketing of fish will want this inclusive study of the causes of spoilage and the means available to delay it. References to the number of 132 should provide a whole summer of reading.

TARR, H. L. A. Microbiological Deterioration of Fish Post-Mortem. Its Detection and Control. Bact. Rev. 18, 1:1 (Mar.), 1954.

Most Oldsters Want to Work—A round dozen of sociologic studies of retirement problems present a wealth of ideas that should prove suggestive to anyone plagued with posers about what to do for the aged of his community. Nothing significant could be said here about this symposium except that it covers a world of territory.

TIBBITTS, C., et al. Retirement Problems in American Society (and eleven related papers). Am. J. Sociol. 59, 4:301 (Jan.), 1954.

Philosophy of Research — You should know about this program for strengthening basic research in the life sciences.

WATERMAN, A. T. The National Science Foundation and the Life Sciences. Pub. Health Rep. 66, 4:378 (Apr.), 1954.

If additional information is desired regarding the articles listed in this Bibliography, please communicate directly with the publications in which they appeared; the addresses are furnished for your convenience.

Am. J. Nursing (American Journal of Nursing), 2 Park Ave., New York 16, N. Y.
Am. J. Sociol. (American Journal of Sociology), 5750 Ellis Ave., Chicago 37, Ill.
Am. Pract. (American Practitioner), 227–231 S. Sixth St., Philadelphia 5, Pa.
Bact. Rev. (Bacteriological Reviews), Williams and Wilkins Company, Mt. Royal and Guilford Aves., Baltimore 2, Md.
Brit. M.J. (British Medical Journal), British Medical Association House, 19 Tavistock Sq., London W.C. 1, England.
GP, American Academy of General Practice, Broadway at 34th St., Kansas City, Kans.
J. Am. Dietet. A. (Journal of the American Dietetic Association), 620 N. Michigan Ave., Chicago, Ill.
J. Roy San. Inst. (Journal of the Royal Sanitary Institute), 90 Buckingham Palace Road, London, S.W. 1, England.
Lancet—7 Adam St., Adelphi, London, W.C. 2, England.
Modern San. (Modern Sanitation), 855 Avenue of the Americas, New York 1, N. Y.
New York State J. Med. (New York State Journal of Medicine), 292 Madison Ave., New York 17, N. Y.
Pediatrics (Journal of the American Academy of Pediatrics), 301–327 E. Lawrence Ave., Springfield, Ill.
Pub. Health (Public Health), Society of Medical Officers of Health, Tavistock House, South, Tavistock Sq., London W.C. 1, England.
Pub. Health Rep. (Public Health Reports), Superintendent of Documents, Gov. Ptg Office, Washington, D. C.

Association News

EIGHTY-SECOND ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
BUFFALO, N. Y., OCTOBER 11–15, 1954

FELLOWSHIP IN THE AMERICAN PUBLIC HEALTH ASSOCIATION

The grade of Fellowship was established in the American Public Health Association in 1922. Professional workers in public health are eligible for election as Fellows under certain conditions and as an indication that they have achieved a recognized professional standing. As of January 1, 1954, the total membership of the Association was 12,464, including 2,904 Fellows, or 23 per cent of the total.

Questions are frequently asked regarding the requirements for Fellowship and the following statement outlines the provisions of the current By-laws governing qualification and election.

Persons who have been members of the Association for at least two years and who have reached their 30th birthday are eligible to apply if, in their opinion, they meet the conditions of one or more of the six clauses in the By-laws defining "an established professional standing." These six possible approaches are as follows:

a. A person who has rendered acceptable service for two or more years in a responsible public health position and who has been awarded in course a degree of Doctor of Public Health, Doctor of Science in Public Health, Doctor of Philosophy in Public Health, Doctor of Medicine with at least one year of graduate study in public health in a university, Master of Public Health, Diploma in Public Health, or other equivalent degrees, according to standards approved by the Executive Board of the American Public Health Association.

b. A person who has been awarded in course an academic or professional degree involving training in public health and who has been regularly engaged in health work for at least five years, having rendered meritorious service as a health officer or in responsible charge of work in either a public or private health agency.

c. A person who has done notable original work in public health or preventive medicine of a character to give him a recognized standing.

d. A person regularly engaged in health work for at least five years, who has given evidence of special proficiency, who has attained a recognized standing.

e. A teacher of public health or one of its constituent sciences who has attained distinction as an expounder of the principles of public health or its constituent sciences. Such a teacher shall have had at least five years' experience as a teacher of public health subjects. Any years of experience as defined in paragraphs "b" and "d" that the applicant may have had shall be considered the equivalent of the same number of years' experience as a "teacher."

f. A person not covered by the above, who has made substantial contributions to public health work in his chosen branch, who has attained a recognized professional standing.

Persons wishing to apply should request a Fellowship application blank from the American Public Health Association Membership Department, 1790 Broadway, New York 19, N. Y. Applications are accepted up to August 1

each year for consideration by the Governing Council at the fall meeting. It is important to make clear that members themselves should take the initiative in submitting such applications. Neither the Sections nor the APHA administrative staff are authorized to solicit applications. This means that, although over 3,000 persons have been duly recognized with this grade of affiliation since 1922, there are other persons well qualified who have never initiated the process of applying for Fellowship. It should be clear that members should not await action by others if they wish to attain Fellowship. It is necessary and proper for them to take the first step.

An application for Fellowship requires sponsorship by two Fellows of the Section with which the applicant desires to be affiliated. These personal signatures are to be obtained by the applicant before submitting the completed application. The APHA office will assist, on request, in determining the Section with which prospective sponsors are affiliated. Applications from persons not wishing to be identified with a particular Section and requesting unaffiliated Fellowship may be sponsored by any two Fellows of the Association.

When properly sponsored and otherwise completed, the application is sent to the APHA office, after which the list of persons applying is published in the American Journal of Public Health, usually in the September issue, but in any case not less than 15 days before the date for the Annual Meeting. An established routine is followed for review by the Section Councils (unaffiliated applications are reviewed by the Executive Board) and by the Committee on Eligibility. This Standing Committee of the Association is made up of one Fellow from each of the 13 Sections, plus a Chairman elected by the Executive Board. This group is under instructions from the Governing Council to examine each application in accordance with the provisions of the clause of the By-laws chosen by the applicant, and to apply the criteria with precision in each case. Final election is by the Governing Council at the second meeting at each annual session.

The privileges of Fellowship include eligibility to serve as an officer of the Association or one of the Sections, Chairman of an Association or Section Committee (over one hundred in number), a member of one of the four Standing Committees, a member of the Governing Council or Executive Board, and the right to vote on amendments to the Constitution. Some Civil Service and merit system records depend upon Fellowship in the American Public Health Association as an achievement deserving recognition in applicants.

The dues of Fellows are $15.00 annually, and include a subscription to the American Journal of Public Health and other services to which members are eligible. Life membership is available at $200.00 covering all future annual dues.

Applications for Fellowship to be considered at the 82nd Annual Meeting in Buffalo, N. Y., October 11–15, should be filed with the Association as soon as they are completed, and in any case not later than August 1. For further information, address the Membership Department, American Public Health Association.

Southern Branch, APHA, Meets in St. Petersburg

The 23rd annual meeting of the Southern Branch, APHA, met in St. Petersburg, Fla., under the presidency of Andrew Hedmeg, M.D., of New Orleans. J. W. R. Norton, M.D., of Raleigh, N. C., was secretary.

The Southern Branch, APHA, which was organized in 1932, is an organization of public health workers from Alabama, Arkansas, the District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Tennessee, Texas, Virginia, West Virginia, and from any Latin American country officially recognized as part of the territory of the American Public Health Association. All members of the APHA residing or working in this territory are ipso facto members of the Southern Branch. In addition, anyone interested in public health and related fields may become an associate member by paying $1.00 per annum.

The theme of the annual meeting was "So Much for So Little."

In addition to the general sessions which considered topics in general, nutrition, and the activities of the Foreign Operations Administration, the curbstone consultation program was again featured. This consisted of nine booths arranged for a half-day program for the consideration of about 40 selected subjects with almost 200 consultants available for informal discussions with those in attendance.

About 500 persons were in attendance. Section programs were organized as follows: Biology, Nutrition, Dental, Sanitation, Health Officers, Health Education, Statistical and Clerical, Laboratory, and Public Health Nursing Sections.

Consideration was given to the pending report of the Expanded Reference Committee on Affiliated Societies and Branches. The report was approved in principle with some editorial changes recommended.

Officers were elected as follows:

President—J. W. R. Norton, M.D., state health officer, State Board of Health, Raleigh, N. C.

1st Vice-President—John C. Swartzwelder, Ph.D., professor of medical parasitology, Louisiana State University, New Orleans, La.

2nd Vice-President—George A. Bunch, D.D.S., director, Division of Dental Health, State Board of Health, Columbia, S. C.

3rd Vice-President—Guy M. Tate, director, Bureau of Sanitation, Jefferson County Board of Health, Birmingham, Ala.

Secretary-Treasurer—Frank M. Hall, M.D., director, State Board of Health Training Center, Gainesville, Fla.

Representative to the APHA Governing Council—Andrew Hedmeg, M.D., director, Division of Preventive Medicine, State Department of Health, New Orleans, La.

Adult Education News

Ruth E. Grout, Ph.D., represents the Association on the Council of National Organizations which is a part of the Adult Education Association of the United States. In this capacity she calls the attention of Journal readers to some of the developments in adult education as follows:

The Red Cross is sponsoring a program on home care of the sick over KUHT in Houston. Education Testing Service, which is promoting research and evaluation in educational television, is testing its effectiveness. If results are favorable, the Red Cross plans to produce films for educational television and classroom instruction.

The University of Georgia has received a grant from the W. K. Kellogg Foundation to build a new adult education center on the campus with dormitory for 400 and a 600-seat auditorium.

The American Library Association has set up an adult education office with Grace Stevenson, associate executive secretary of the ALA, as staff executive.

An intensive three-day training pro-

gram on planning conferences and workshops was conducted in New York, April 7–9, by Conference Counselors. Write for information to Conference Counselors, 114 East 40th St., New York 16, N. Y.

Raymond C. Lewis, from the American Cancer Society, and chairman of the Advisory Board for Association Films, has described a new training device in film put out by Seminar Films. With a business concern or organization, the company analyzes a particular training problem, particularly as it relates to attitudes or skills. After this problem is refined to its basic elements, these are then pictured in progressive sequence in films to run about five minutes. The film is projected from a cartridge attached to any 16 mm. projector which runs the film in a continuous loop for repeat use. To date the loop films have been developed mainly for teaching sales, verbal, and motor skills. For more information on this new audiovisual aid, see Seminar Films, 347 Madison Ave., New York 17, N. Y.

"The International Directory of Adult Education," issued by UNESCO has been revised. It summarizes the international agencies of an official character, as well as listing nongovernmental organizations working in adult education, and gives the present pattern of adult education in 50 countries. Columbia University Press, 2960 Broadway, New York, N. Y.; $4.00 per copy.

This material and others relating to adult education is found in CNO News published by the Council of National Organizations, Room 205, The Cooper Union, 4th Ave. and 7th St., New York 3, N. Y.

Meetings of Affiliated Societies

Illinois—Over 400 persons attended the 14th annual meeting of the Illinois Public Health Association, April 1–2. Edward G. McGavran, M.D., dean, School of Public Health, University of North Carolina, gave the keynote address on "What Is Public Health in 1954." A panel of representative citizens discussed "What the Citizen Thinks About Public Health." A panel on "Patterns in Citizen Participation" was moderated by Richard W. Poston, director, Division of Area Services, Department of Community Development, Southern Illinois University. "Teamwork in Public Health" was the topic for discussion by 10 interest groups.

The following officers were elected:

President—Felix A. Tornabene, M.D., health officer, Northeastern District, State Department of Health
President-Elect—Ben D. Kiningham, Jr., executive secretary, Illinois Tuberculosis and Health Association
Secretary-Treasurer—Lillian Nash, chief, Division of Nutrition, Cook County Health Department

Iowa—The Iowa Public Health Association met in Des Moines on April 8–9, with an attendance of nearly 200. W. W. Bauer, M.D., editor of "Today's Health," was the convention luncheon speaker.

Newly elected officers, all on the staff of the State Department of Health, are:

President—Stanley L. Hendricks, D.V.M., public health veterinarian
President-Elect—Mattie Brass, R.N., director, Division of Public Health Nursing
Vice-President—Loren E. Chancellor, director, Division of Vital Statistics
Secretary-Treasurer—K. E. Hartoft, director, Finance and Personnel

Kansas—The 12th annual meeting of the Kansas Public Health Association took place March 29–31 in Wichita with an attendance of 200. Three general sessions were held as well as sessions sponsored, respectively, by the Health Officers, Public Health Nursing, Sanitation, and Special Services Sections. The Samuel J. Crumbine Award was presented to Earle G. Brown, M.D., formerly Kansas health officer and cur-

rently health commissioner of Nassau County, N. Y.

The following officers will serve for the coming year:

President—Thomas R. Hood, M.D., executive secretary, Kansas State Board of Health, Topeka
President-Elect—Dwight F. Metzler, director, Division of Sanitation, State Board of Health
Vice-President—Esther Treadway, school nurse, Wichita
Secretary-Treasurer—Evelyn Ford, secretary, Division of Local Health Services, State Board of Health

Louisiana—The fifth annual meeting of the Louisiana Association of Public Health Workers was held in Monroe on April 8 and 9, with an attendance of more than 300. This association was voted affiliation with the American Public Health Association in November, 1953, and changed its name to the Louisiana Public Health Association.

Among the speakers at the Monroe meeting were S. J. Phillips, M.D., Louisiana health officer, and Clair E. Turner, Dr.P.H., assistant to the president of the National Foundation for Infantile Paralysis. The association's two annual awards were presented—the Dr. C. B. White Memorial Award to a person professionally engaged in public health work; the Axson-Choppin Award to a person outside the field, each for distinguished service in the cause of public health. The former was presented to Ben Freedman, M.D., director of the State Health Department's Training Center in New Orleans; the latter to Arthur A. Herold, M.D., practicing physician of Shreveport.

Newly elected officers, each of whom is on the staff of the State Health Department, are:

President—George H. Hauser, M.D., director, Division of Laboratories
Vice-Presidents—Mrs. Velma Brusse, records consultant; George Ineichen, health educator
Secretary-Treasurer—Lloyd Methe, regional sanitarian
Past-President and Delegate to Southern Branch—T. D. Boaz, Jr., M.D., medical director, Northern Area
Delegate to APHA—Ben Freedman, M.D.

Texas—The 1954 annual meeting of the Texas Public Health Association was held in Galveston, February 14–17, with approximately 500 attending.

An honorary life membership was awarded to the outgoing executive secretary, Earle W. Sudderth, sanitary engineer and division manager, Orkin Exterminating Company, Dallas, and currently secretary of the Engineering Section of the APHA.

The new officers are:

President—Edward F. Riedel, personnel director, State Department of Health, Austin
President-Elect—M. L. McDonald, administrative assistant, Dallas Health Department
Vice-Presidents—W. T. Ballard, district engineer, State Department of Health, Tyler; W. S. Brumage, M.D., director, Division of Cancer Control, State Department of Health
Secretary-Treasurer—H. E. Drumwright, sanitary engineer, Dallas Health Department

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APHA membership application blank on page XXVII

82nd ANNUAL MEETING

HOW TO MAKE HOTEL RESERVATIONS FOR THE BUFFALO ANNUAL MEETING

A HOUSING BUREAU will be operated by the Buffalo Convention Bureau for the 82nd Annual Meeting of the APHA in Buffalo, October 11–15. Since all requests for rooms will be handled in chronological order, you are urged to send in your reservation as quickly as possible on the form below.

Hotels and Rates

Hotel	Single	Double	Twin
Buffalo—Washington & Swan Sts.	$4.00– 6.50	$7.00– 9.50	$ 9.00–10.00
Graystone—Johnson Pk. & Delaware	2.50– 6.50	4.50– 9.50	6.50– 9.50
Lafayette—Washington & Clinton	5.25– 9.00	8.00–14.00	10.00–13.00
*Markeen—Main at Utica	3.50– 5.50	5.50– 8.50	8.00– 9.00
Midtown—430 Delaware Ave.	3.25– 5.00	5.50– 7.75	7.75– 8.00
Lenox—North Near Delaware	6.00– 8.00	8.50–12.00	9.00–14.00
*Richford—210 Delaware Ave.	3.00– 4.50	5.00– 8.00	6.00– 8.00
Sheraton—715 Delaware Ave.	5.85– 9.35	9.35–10.00	8.85–12.85
Statler—Delaware Ave. at Niagara Sq.	5.50–10.00	8.00–13.00	10.00–16.00
Stuyvesant—245 Elmwood Ave.	6.00–10.00	9.00–16.00	10.00–18.00
*Touraine—274 Delaware Ave.	5.00– 8.00	7.50– 9.00	8.50– 9.00
Westbrook—675 Delaware Ave.	5.00– 8.00	8.00– 9.00	10.00–12.50
Worth—200 Main St.	2.75– 4.50	4.75– 6.50	7.50
*Genessee—308 Pearl St.	2.50– 4.00	5.00– 6.50	7.00

* In addition to Private Baths these Hotels also have rooms with adjoining baths, or without baths.

Rates for Suites available on request.

HOTEL RESERVATION FORM

MAIL TO: Mrs. Evelyn McCarthy, Housing Bureau
155 Franklin Street, Buffalo, N. Y.

PLEASE MAKE RESERVATIONS NOTED BELOW: (Please Print or Type.)

First Choice ..... Hotel Arrival: ....., at ..... a.m. ..... p.m.

Second Choice ..... Hotel Departure: ....., at ..... a.m. ..... p.m.

Third Choice ..... Hotel

..... Single room @ $..... ..... Twin Bedroom @ $.....

..... Double Bedroom @ $.....

ARE YOU COMING BY CAR? YES..... NO.....

NAMES OF ALL OCCUPANTS: ADDRESSES:

....

....

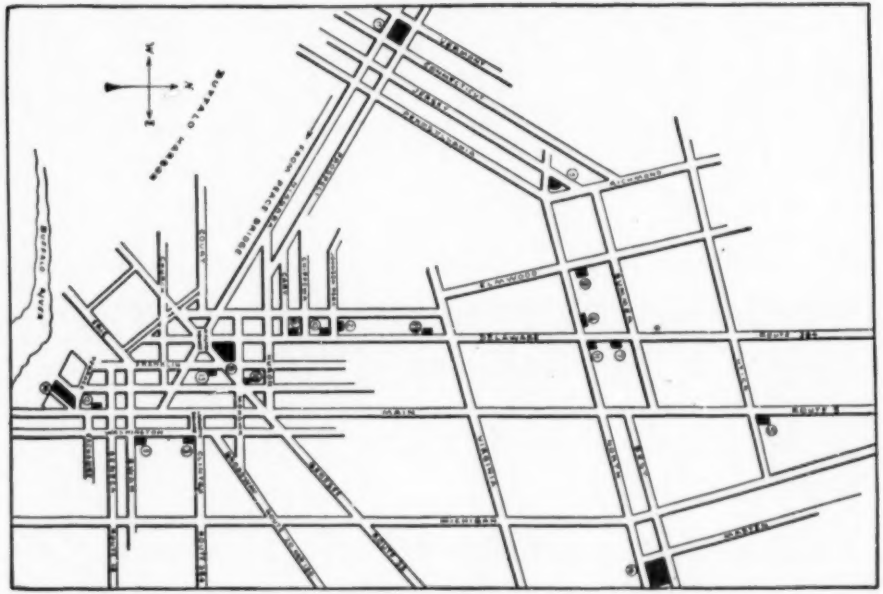
....

MAIL CONFIRMATION TO: Signed: .....

Address: .....

City Zone State

Street Plan of Buffalo Showing Location of Housing Bureau Hotels



Map Key	Hotel
1	Buffalo
2	Graystone
3	Lafayette
5	Markeen
19	Midtown
4	Lenox
6	Richford
7	Sheraton
8	Statler
9	Stuyvesant
10	Touraine
11	Westbrook
12	Worth
18	Genesee
13	Buffalo Convention Bureau
14	Memorial Auditorium
15	Kleinhans Music Hall
16	106th Regiment Armory
17	174th Regiment Armory

EMPLOYMENT SERVICE

The following pages present information for those seeking public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

POSITIONS AVAILABLE

Director, Division of Disease Control—Includes responsibility for communicable diseases, tuberculosis, venereal disease, cancer and heart, industrial hygiene, and a state chest x-ray survey. M.P.H. and public health experience desired but not essential. Salary $10,000–$12,500, depending upon qualifications. G. D. Carlyle Thompson, M.D., Montana State Board of Health, Helena, Mont.

Public Health Physician—to direct department of public health and preventive medicine in medical school. Possible official connection with local health department. Must have M.P.H. Teaching experience desirable. Dr. F. G. Gillick, Dean, The Creighton University, School of Medicine, Omaha 2, Neb.

Health Officer—with training and experience, young. For Orange County, Orlando, Fla. Population 140,000. $9,900, plus travel; merit system and retirement. Wilson T. Sowder, M.D., State Health Officer, Post Office Box 210, Jacksonville 1, Fla.

Medical Health Officer—for an established county health department of 37,000 in northwestern Illinois. $7,200–$9,000, plus travel allowance. Qualified physician may start above minimum. President, Lee County Board of Health, 123 East First St., Dixon, Ill.

Physician, Health Commissioner—Minimum salary $8,000, plus car expense. **Supervising Nurse**—Minimum salary $4,200, plus car expense. **Two Public Health Staff Nurses**—Minimum salary $2,880, plus car expense. Sandusky City and Erie County, Ohio. Population 52,000 (small county) located on Lake Erie. Sandusky City and Erie County Health Dept., Masonic Temple Bldg., Sandusky, Ohio.

Research Director—to develop an active research program for the Saratoga Spa at Saratoga Springs, N. Y. Ph.D. with experience in physiology. Knowledge of biochemistry also useful. Permanent New York State Civil Service position (G-27 with salary of $6,562–$7,992). Possible appointment to teaching staff of Albany Medical College. Dr. Frank W. Reynolds, Medical Director, Saratoga Springs Commission, Saratoga Springs, N. Y.

Head, Health Education Section—Opportunity available for experienced health educator to direct the State of Washington's health education services. M.P.H. degree and five years of experience required. $5,904–$7,032 per annum in addition to usual merit system leave and retirement provisions. J. A. Kahl, M.D., State Director of Health, 1412 Smith Tower, Seattle, Wash.

Bacteriologist—Arlington County Health Department. $3,500. Retirement. Vacation with pay. Five-day week. Jack Foster, Director of Personnel, Court House, Arlington, Va.

Medical Social Work Adviser—$3,692–$4,316 per annum. Open to female citizen residents of the United States. Personnel Director, Municipal Bldg., Hartford, Conn.

Public Health Laboratory Supervisor—Includes clinical, communicable disease, chronic diseases, environmental sanitation, and related fields. $5,775–$6,554 and hospital and surgical insurance. Commissioner of Health, 730 Washington Ave., Racine, Wis.

Nutritionist—Master's degree in home economics with major in foods and nutrition and one-year experience as dietitian or nutritionist in work related to public health. $326–$435. C. Wedgeworth, Supervisor, Recruitment and Examining, Room 412 City Hall, Dallas, Tex.

Dentist—Eligible for Michigan license for full-time permanent position. Saginaw County Dept. of Health, 1501 N. Michigan Ave., Saginaw, Mich.

Public Health Physician—Health officer for established county health department of 32,000 in south central Illinois. $7,000–$9,000, plus travel allowance. C. H. Zoller, M.D., President, Board of Health, 403 N. Montgomery Ave., Litchfield, Ill.

Public Health Educator I—for general public health education program, requiring a master's degree. **Nutritionist I**—for public health nutrition program, requiring one year's experience in addition to a college degree. Civil Service appointment. Salary range for both positions $4,069–$5,251. E. R. Krumbiegel, M.D., Milwaukee Health Dept., City Hall, Milwaukee, Wis.

Assistant Health Officer—to plan, promote, and direct the county school health and communicable disease program. $777–$933.

M.P.H. California license or eligibility for one, two years of full-time public health administrative experience required. Graduate work or hospital speciality may be substituted for part of experience. **Public Health Nurse**—$341–$410. Requires valid license as R.N. in State of California and California Public Health Certificate or eligibility for one. Written examinations will be given out of state if possible. Contra Costa County Civil Service Commission, P.O. Box 710, Martinez, Calif. Deadline for filing application for both positions is July 18, 1954.

Public Health Nurse—Teacher of public school health, Chicago public schools. Six-hour day, five-day week, 40-week year. $3,400, reaching maximum of $5,650 in 10 years. Require bachelor's degree in public health nursing, plus one-year experience in community nursing. Madeline Roessler, Supervisor, Chicago, Public Schools, 228 N. LaSalle St., Chicago 1, Ill.

Public Health Nurses—Two openings. One for desert area, salary $343; and one near San Bernardino starting at $311. Eligibility for California registration and a car required. County Civil Service Office, 236 Third St., San Bernardino, Calif.

Public Health Nurse—Experience in public health nursing or one year of formal training required. For research project in public health nursing and bedside nursing in rural area of northern Michigan. $3,600; seven cents per mile travel. C. E. Merritt, M.D., District Health Dept. No. 1, Lake City, Mich.

Nursing Clinical Instructor—for developing outpatient department teaching unit. Degree in public health nursing or degree in nursing, plus completion of course in public health. General public health nursing experience with minimum of one year in teaching or supervisory capacity. Outpatient experience desirable. Permanent employment. Dean, School of Nursing, Northwestern State College, Natchitoches, La.

POSITIONS WANTED

Medical Entomologist—M.S., plus some work toward Ph.D. Experience: four years in Sanitary Corps of Army and seven years with large public health organization. Desires position utilizing background of environmental sanitation, particularly investigation and control of insects of public health significance. **Box S-21,** Employment Service, APHA.

Ph.D. in entomology and bacteriology, Desires **Research or Teaching Position.** Two years of teaching experience; experience in polio, Coxsackie, and enteric isolations. Publications on mites, fly transmission of enteric diseases, etc. **Box L-35,** Employment Service, APHA.

Public Health Dentist—D.D.S. and M.P.H. and additional graduate work in medical sciences. Experience in hospital dental clinic for five years. Desires position in teaching, research, or public health. **Box D-11,** Employment Service, APHA.

Public Health Engineer—B.S.C.E. (Sanitary), M.P.H. Married, family. Five years of experience in local health departments, general sanitation program. Specialties: water, sewage, hospital, food, milk. Have administrative experience. **Box S-22,** Employment Service, APHA.

All communications on the following commercial advertisements should be sent to Burneice Larson, Medical Bureau, Palmolive Building, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE

(a) Medical officers, public health nurses, health educators, sanitarians; foreign assignments; knowledge of Spanish, French, or Portugese required. (b) Physician, preferably with M.P.H., to direct county health department; well staffed; metropolitan area, Midwest; minimum $12,000. (c) Public health nurse qualified teaching; interesting opportunity, university department of public health; East. (d) Instructor in health; duties: supervising health program, counseling, teaching; 350-bed general hospital; college town; East. (e) Director, nursing service, public schools; residential town, East; $4,500–$6,000. (f) Industrial hygienist; insurance company; Chicago area. (g) Health educator; executive secretaryship, health agency; $6,500; Midwest. Burneice Larson, Medical Bureau, Palmolive Building, Chicago 11, Ill.

OPPORTUNITIES WANTED

(a) Public health physician; Diplomate; 12 years' administrative experience. (b) Public health nursing administrator; M.A.; seven years' administrative. (c) Health educator; four years' teaching; three years' health educator, metropolitan health department. (d) Statistician; M.A.; six years, chief, state health department statistics; (e) Sanitary engineer; B.S. (chemical engineering); nine years, state health department. Burneice Larson, Palmolive Building, Chicago 11, Ill.

News from the Field

The Child in a New Name and Dress

The 18-year monthly, "Child," of the U. S. Children's Bureau, at the beginning of 1954 became a bimonthly and was renamed "Children." At the same time, it was restyled as to format and printing. It now comes out in traditional magazine size with a royal blue cover and black and white printing. In keeping with the new method of "uniting to conquer," the foreword reports that it "will address itself 'across the board' to all professions concerned with the well-being of children." It will offer "a balanced fare of technical articles on health, welfare, and child development . . . relate what needs doing, and why; who's doing what and how." There is provision for a limited number of free subscriptions for relevant organizations. Gov. Ptg. Office, Washington 25, D. C.; $1.25 yearly.

Another Look at Health Councils

The National Health Council has organized a Committee on State and Local Health Councils. As outlined by the Board of Directors, the committee is to become familiar with councils and provide information about them to member agencies as well as opportunity to exchange experience, particularly with reference to the effect of councils on member agency programs.

The committee is expected to develop recommendations for stimulating and strengthening local health councils. It will explore the most effective relationship between local councils and the national body, as well as relationship of activities on behalf of councils and the work of the National Advisory Committee on Local Health Units.

As a means of exchanging ideas and experience among health councils, a news bulletin is under consideration, as well as changes in the current NHC kit, "Aids to Community Health Planning." The latter is also being studied by the Conference for Health Council Work, a member of NHC.

Margaret Barnard, M.D., associate professor of public health practice, Columbia University School of Public Health, is chairman of the new committee, as well as representative of the American Public Health Association. Each of the 44 members of the council has been invited to membership on the committee which will also include representation from state and local councils.

Third Annual Honor Awards Ceremony

At the third annual Honor Awards Ceremony of the U. S. Department of Health, Education and Welfare in Washington on April 9, Secretary Oveta Culp Hobby presented four distinguished service and seven superior service awards, together with one unit citation for superior service to employees of the department.

Of the 11 individual awards, six were to employees of the Public Health Service, among them Jesse P. Greenstein, M.D., who received a distinguished service award "for his outstanding contributions to the field of enzyme chemistry"; Ad Harris "for outstanding accomplishments in the field of serology"; Nina L. Norman "in recognition of her meritorious contributions to public health in the administration of the federal-state grant-in-aid programs"; and to Lida J. Usilton "for outstanding accomplishment in accelerating the progress of venereal disease control."

Two of the 11 were employees of the Food and Drug Administration; Irvin Kerlan, M.D., medical officer "for dedicated service to public health and education and unusual accomplishments in administration and authorship"; and Henry Welch, M.D., "for outstanding

contributions to the field of public health and science and for his distinguished skills in administration and authorship."

The latter received a distinguished service award as did Dr. Greenstein of the Public Health Service and Winifred Overholser, superintendent of St. Elizabeths Hospital. Drs. Kerlan and Welch and Mr. Harris are members of the American Public Health Association.

International Social Work Meeting

The seventh International Social Work Conference will be held in Toronto, Canada, June 27–July 2. Its theme is "Promoting Social Welfare Through Self-Help and Cooperative Action." Mornings will be devoted to panels dealing with various aspects of the theme, afternoons to study groups.

The United States Committee on Promotion of the Conference is headed by Leonard Mayo, director of the Association for the Aid of Crippled Children and includes Reginald M. Atwater, M.D., executive secretary of the American Public Health Association, and Conrad Van Hyning, director of the American Social Hygiene Association. George Rabinoff of the National Social Welfare Assembly is the committee's executive secretary to whom requests for further information and preregistration application forms should be sent. 345 East 46th St., New York 17, N. Y.

Attendance at the conference is limited to members. Membership fee is $5; registration fee, $10.

The International Conference was first proposed by the late René Sand at the 50th annual meeting of the U. S. National Conference of Social Work in Washington, D. C., in 1923. The first International Conference was held in 1928, with two later meetings at four-year intervals and interruptions by World War II. The first full-scale post-war conference in Paris in 1950, which brought together 1,800 representatives from 47 countries, initiated biennial conferences.

Hospital Accreditation Commission

The Joint Commission on Accreditation of Hospitals has made its first report. Among the 3,418 hospitals accredited in 1953, the great majority, 85 per cent, were fully accredited and 15 per cent were provisionally accredited. Of the nearly 1,300 hospitals visited in 1953 more than 10 per cent were denied accreditation and nearly 16 per cent were provisionally accredited.

The Joint Commission was created in 1951 to take over the accrediting activities formerly carried on in the United States by the American College of Surgeons. This organization, together with the American College of Physicians, the American Hospital Association, the American Medical Association, and the Canadian Medical Association make up the commission and share its work and expenses.

Edwin L. Crosby, M.D., who has been director of the commission since November, 1952, has recently resigned to become executive director of the American Hospital Association. He has been succeeded by Kenneth B. Babcock, M.D., former director of Grace Hospital, Detroit.

ASHA Snow Award to Lida Usilton

The 18th William Freeman Snow Award of the American Social Hygiene Association was presented to Lida J. Usilton of the Public Health Service at the association's annual meeting in New York on April 26. The citation reads in part:

> Pioneer explorer, inventor, guide, teacher and worker in the field of venereal disease control . . .
>
> The American Social Hygiene Association presents this medal for distinguished service

to humanity, with affection, appreciation and a special satisfaction in bestowing the Snow Award on one so closely identified with its original purpose.

Miss Usilton has been continuously with the Public Health Service since 1920, except for a period when her unit was transferred to the Veterans Bureau. Entering the Service as supervisor of a statistical unit in the Hospital Division, she established a nation-wide report system in 1939. Most recently, she began the liquidation of rapid treatment centers and the establishment of prevention and control centers as acceptable outpatient treatment began. She has developed selective mass testing technics for syphilis and applied speed-zone epidemiology technics to control the spread of gonorrhea.

Alaska Health Survey to Continue

The U. S. Department of the Interior has announced that the health survey of Alaska begun in 1953 will continue during the summer of 1954 under the chairmanship of Thomas Parran, M.D., dean of the University of Pittsburgh Graduate School of Public Health. Special interest will focus on tuberculosis, sanitation, nursing, mental health, maternal and child health, crippled children's programs, and clinical services.

Among those who will advise with Dr. Parran are James E. Perkins, M.D., of the National Tuberculosis Association; Clarence Sterling, C.E., of the Massachusetts Department of Public Health; Walsh McDermott, M.D., editor of the American Review of Tuberculosis; Ruth Freeman, Ed.D., of the Department of Public Health Administration, Johns Hopkins University; and James A. Crabtree, M.D., J. R. McGibbony, M.D., Samuel M. Wishik, M.D., and Antonio Ciocco, D.Sc., of the Graduate School of Public Health, Pittsburgh.

Akron, Ohio, Abandons Fluoridation

In July, 1953, the City Council by an eight-to-three vote, enacted an ordinance to fluoridate the city's water supply. Fluoridation was put into effect late in the year. Since that time a campaign against "mass medication" and other charges has been going on with the result that on March 9, 1954, the City Council repealed the 1953 ordinance, this time by a nine-to-four vote. A movement has been started to put the measure on the November ballot. The Akron Beacon-Journal comments, "If the council's repeal of the fluoridation ordinance proved anything, it proved that emotionalism is more potent than scientific facts."

American Heart Association Elects

During the annual meeting of the American Heart Association in Chicago in April, E. Cowles Andrus, M.D., associate professor of medicine, Johns Hopkins University Medical School, was installed as president, succeeding Robert L. King, M.D., of Seattle, who became chairman of the association's Scientific Council.

Irvine H. Page, director of research, Cleveland Clinic Foundation, was named president-elect. Among the vice-presidents elected is David D. Rutstein, M.D., professor of preventive medicine, Harvard Medical School.

First State Gerontology Society

Reportedly the first state in the nation to have a state Society of Gerontology "with a long-range program designed to make a better life for the aged," the Connecticut Society of Gerontology was organized late in 1953. Its first annual meeting, following a year of preorganization activities, was held on November 20 and included a panel on Older People in Connecticut.

Hector LeMaire, educational consultant for International Correspondence

Schools, was named president and Alexander Tutles, M.D., chief of the Medical Services Section, Connecticut State Health Department, president-elect.

WHO News

Venezuelan Rehabilitation Center

A pilot rehabilitation center providing physical and occupational therapeutic services is being established in Venezuela with the help of the United Nations Technical Assistance Administration. The agreement with the Venezuelan government was signed during the Inter-American Conference meeting in Caracas in March.

The center is being directed by Dr. Gustave Gingras, medical director of the Rehabilitation Society for Cripples, Montreal, Canada, with the assistance of two physiotherapists and one occupational therapist. The medical coordinator is a Venezuelan specialist, Dr. Alejandro J. Rhode. Once the center is in full operation, Venezuelan personnel are scheduled to take over complete responsibility.

A further indication of UN interest in rehabilitation is "Rehabilitation of the Handicapped," recently published as a special issue of the United Nations Social Welfare Information Series. This stresses that the handicapped person is "an individual with full human rights" who will in most cases become an economic asset rather than a burden to his country if given protection, assistance, and a chance to rehabilitate himself. The booklet is intended primarily for rehabilitation workers. Copies are available on a limited basis on request to the Department of Social Affairs, United Nations, N. Y.

Meat Hygiene Seminar

With the cooperation of the Danish government and FAO, the WHO Regional Office for Europe held a meat hygiene seminar in Copenhagen, February 22–27. Veterinarians, food inspectors, and health administrators from 22 countries in Europe and the Mediterranean area participated on nomination by their respective governments.

The seminar agreed that housewives as well as professional food handlers should know what measures are needed to prevent spread of disease through meat and meat products. An informed public would demand better meat handling methods and inspection technics, and better results might be expected "than from an attempt to impose meat hygiene with a government blueprint."

Compulsory, periodic medical examinations for food handlers were discussed. Although participants agreed that stringent precautions are indicated in such places as children's hospitals, school canteens, and youth camps, it was agreed also that some of the energy, time, and money needed for periodic examination of all food handlers might better be used in educating the public about the various problems of meat hygiene. Further, the supply of meat could be increased by the improvement in slaughter house methods.

In avoiding outbreaks of illness, social, economic, and other environmental factors must be considered. Public campaigns against eating raw meat, improved sewage disposal facilities, keeping meat at low enough temperatures to prevent bacteria growth, and above all accurate information on meat poisoning were recommended. Of few countries can it be said that they have too much inspection, of many that they have too little.

Background information presented at the seminar included:

Trichinosis is probably a worse menace in the United States than in any other country with estimates ranging from 2.5 to 30 per cent of the population harboring the trichinae.

In 1950, in England and Wales, 68

per cent of food poisoning outbreaks affecting more than one person and where the source of infection was known were due to meat.

In Sweden in 1953 an outbreak of food poisoning due to meat affected more than 7,700 persons, 90 of them fatally.

Estimates indicate that between 1945 and 1947, 32 per cent of food poisoning outbreaks in the United States were due to meat.

Education Program in Beirut

Ten young Palestinian refugees are being trained in health education at the United Nations Relief and Works Agency for Palestine Refugees with headquarters in Beirut. Six months of academic training is under the direction of a WHO health educator, W. A. Darity, and 10 other UN specialists in communicable disease control, environmental sanitation, adult education, and community and school health education. A second six months will be spent in field training in refugee camps and villages in the countries from which they were recruited—Gaza, Jordan, Lebanon, and Syria.

World Report on Traffic Accidents

A WHO study, reported to be the first of its type ever attempted, "shows the repercussions of various transport accidents on mortality by age and sex." It finds that up to half of all persons dying between the ages of 15 and 24 are killed in traffic accidents, that motor vehicles cause more than 70 per cent of all transport deaths, that children are the chief victims of motor vehicle accidents, and that in some countries transport accidents rank with tuberculosis as a cause of death.

Data were collected from 15 countries —Canada, Australia, New Zealand, Union of South Africa, Japan, the United States, and nine European countries. The study, "Mortality from Transport Accidents," will be found in WHO Epidemiological and Vital Statistics Report, October-November, 1953, Columbia University Press, 2960 Broadway, New York 27, N. Y.; $1.

Improving the Health of Seafarers

A Joint Committee of WHO and the International Labor Organization on the Hygiene of Seafarers met in Geneva in April. Recommendations were made for the improvement of the health of seafarers and of available medical services. The members agreed on the general principle that seamen in every part of the world and on board ship should be able to obtain prompt and adequate medical services. To this end, the committee specifically recommended:

1. Medical advice by radio should be available around the clock to ships at sea.
2. Every ship should carry a medicine chest with a recommended assortment of medicaments based on WHO's International Pharmacopoea.
3. All new entrants to merchant navies should be examined for tuberculosis.

The United States member of the committee named by WHO is G. H. Hunt, M.D., of the Public Health Service.

Korea Agricultural College Rebuilt

Another vital facility for the health and well-being of the people of the Korean Republic is now back to near normal operation. The United Nations announces that reconstruction and repair work has been completed on 110 buildings of the Suwon Agricultural College and Agriculture Experiment Station. Repairs were made by the United Nations Korean Reconstruction Agency in cooperation with the Korean government.

At a ceremony marking completion of this part of the work, Lt. General John B. Coulter, agent general of UNRRA, was among the speakers and pointed out the importance of this in-

stitution in making the land more productive for the sustenance and nourishment of the Korean people.

Further reconstruction will include new laboratories and research rooms.

1953 Demographic Yearbook

At the present annual rate of increase, the world's present population of two and a half billion will have doubled by 2020, 70 years hence. This is one of the conclusions of the 1953 Demographic Yearbook recently published by the UN Statistical Office. A trend toward higher birth rates in the early reproductive years among women is noted, also a trend toward lower death rates in most countries, particularly with respect to infant mortality. White women in the United States have the highest recorded life expectancy, 72.4 years. For men, the highest figure is 69.4 for the Netherlands.

The Yearbook contains an extensive bibliography of references to the most recent published census returns, sources of periodic and other demographic statistics since 1920, and life tables since 1900 for all countries publishing such material. Columbia University Press, 2760 Broadway, New York, N. Y.; $6.50 cloth; $5 paper.

Philippine "Dieldrin" Field Tests

Field tests to determine the effectiveness of Dieldrin, a new insecticide for controlling malaria, began in northern Luzon, Philippines, in March. The pilot project is planned to carry out control measures during a complete yearly cycle of malaria transmission after which results will be evaluated. A training program for local and auxiliary personnel is a part of the project.

The tests are a joint project of the Philippine government, UN Technical Assistance, U. S. Foreign Operations Administration, and WHO, which is providing a malariologist and an entomologist member of the project team.

The new insecticide has not hitherto been used in the Philippines and, in fact, probably not in the western Pacific. If it proves effective for the Philippines, it could materially reduce the present incidence of two million Filipino victims of malaria with 10,000 deaths annually. Since most of the victims are farmers, there is a resultant high loss in food production.

PERSONALS

HECTOR ACUNA, M.D., M.P.H.,† former district and city health officer, Piedras, Negras, Coahuala, Mexico, has been appointed chief medical consultant for the Dominican Republic of the Pan American Sanitary Bureau, with headquarters in Ciudad Trujillo.

HUBERT EARLE BELUE, former sanitarian, Anderson County (S.C.) Health Department, has been named sanitarian, Home Accident Prevention Section, Kentucky State Department of Health, Louisville.

LEONARD M. BOARD,* chief, Division of Sanitation, Public Health Service, has been assigned as regional sanitary engineer adviser for the Institute of Inter-American Affairs, Foreign Operations Administration in Lima, Peru. MALCOLM C. HOPE,* assistant chief, is current acting chief of the division.

ANTHONY J. BOROWSKI, M.D.,* former chief, Division of Hospital Facilities, Ohio Department of Health, has resigned to become administrator of Citizens Hospital, Barberton.

THOMAS E. BRAMBLE † has been named executive director of the Philadelphia (Pa.) Tuberculosis and Health Association, succeeding CHARLES KURTZHALZ resigned.

MERLE BUNDY, M.D., M.P.H.,† former chief, Bureau of Preventive Medicine, Pittsburgh (Pa.) Department of Health, has been appointed physician of the Pittsburgh Works, Jones & Laughlin Steel Corporation, succeeding CARL W. GATTER, M.D., now assistant to the medical director for special health projects.

D. A. CHAMPAIGN, M.D.,† district health officer for the Cowlitz-Wahkiakum District Health Department at Kelso, Wash., is on leave of absence to obtain an M.P.H. at the University of Michigan.

EARL H. COLEMAN, M.D., director of health

* Fellow.
† Member.

services and professor of biology, Fresno State College (Calif.), has retired.

SHERMAN COMINGS,† sanitarian, Lowndes County Health Department, Valdosta, Ga., is with the U. S. Operations Mission in Baghdad, Iraq, as a biologist.

CURTIS F. CULP, M.D.,† former director, Medical Service Division, National Foundation for Infantile Paralysis, has been appointed director of Medical Field Services, United Cerebral Palsy, New York City.

MARTIN L. DAVIS, formerly with the Roanoke (Va.) City-County Health Department, is now a sanitarian, Ottawa County, Ohio.

ELIZABETH P. FLEMING, M.D.,* formerly with the U. S. Public Health Service, has been appointed director of the local health unit serving Atoka, Choctaw, and McCurtain Counties, Okla., to succeed LILLIAN M. HOKE, M.D., resigned to do postgraduate work.

HARALD FREDERIKSEN, M.D.,† Public Health Service officer, is serving with the U. S. Operations Mission in Iran as a physician.

ALLEN WEIR FREEMAN, M.D.,* consultant in public health administration, Maryland State Health Department, has retired after a half-century in the field of public health and has been nominated "Consultant Emeritus."

HAROLD K. FULLER,* has been loaned by the Illinois Department of Public Health, to be executive secretary of the Illinois State-Wide Public Health Committee, also in Springfield.

ROY GLOVER,† former sanitarian, Dade County, Fla., is now assistant sanitarian, Northeast District Office, Ohio State Health Department.

HARVEY A. ITANO, M.D., received the 1954 Eli Lilly and Company Award in biological chemistry and ALTON MEISTER, M.D., the 1954 Paul-Lewis Laboratories Award in enzyme chemistry, at the recent annual meeting of the American Chemical Society. Both winners are on the staff of the National Cancer Institute. Their awards include $1,000 and a gold medal.

LAWRENCE C. KOLB, M.D., consultant in psychiatry, Mayo Clinic, Rochester, Minn., and associate professor in psychiatry, Mayo Foundation, has been appointed director of the New York State Psychiatric Institute and professor of psychiatry and executive officer of the Department of Psychiatry, Columbia University, College of Physicians and Surgeons, New York City.

LE VAN KHAI, M.D.,† director of Health of North Viet-Nam, Hanoi, has been visiting the United States on a tour arranged by the Public Health Service.

JAMES LIEBERMAN, D.V.M.,* former assistant chief, Special Projects Division, Bureau of State Services, Public Health Service, is now veterinary epidemiologist, Bureau of Epidemiology and Communicable Disease Control, New York State Department of Health, Albany.

HERBERT L. LOMBARD, M.D.,* director, Division of Cancer and Other Chronic Diseases, Massachusetts Department of Public Health, was recently presented the 1953 award of the Public Health Cancer Association of America "in recognition of his outstanding career in preventive medicine and his epoch-making contribution in the field of cancer control."

YOLANDE LYON,† formerly associated with the American Diabetes Association and the National Health Council, is now health education associate, United Community Services of Metropolitan Boston (Mass.), to act as secretary of the Diabetes Committee of the Health Division.

AIMS C. MCGUINNESS, M.D., dean, University of Pennsylvania Graduate School of Medicine, has been appointed clinical consultant for 10 hospitals being constructed by the United Mine Workers Welfare and Retirement Fund in Kentucky, Virginia, and West Virginia, with responsibility for staffing the hospitals and developing internship and residency programs.

PAT MCKISIC, a graduate of the School of Public Health, University of North Carolina and former sanitarian in Paulding County, Ohio, is now sanitarian in the Ohio State Health Department's Southeast District.

ELLEN CUSH MCNELLIS, M.D., D.P.H., former assistant health officer, Glasgow, Scotland, is now head of the Maternal and Child Health and Crippled Children's Section, Washington State Department of Public Health, Seattle.

EDWARD O'ROURKE, M.D.,† health officer of Cambridge, Mass., has resigned to become director of the Emergency Migration Program from the American Sector of Austria.

WILBUR E. PALMER,* former director of the sanitation program of Wichita-Sedgewick County, Kans., has joined the U. S. Operations Mission's public health staff in Pakistan.

EMIL E. PALMQUIST,† former director of health activities in Iran under the Point Four Program, is now assistant chief, Division of International Health, Public Health Service.

J. L. PAWAN, D.V.M., of Trinidad, British West Indies, was awarded an honorary fel-

* Fellow.
† Member.

lowship in the American Board of Veterinary Public Health during the recent meeting of the Southeastern Rabies Conference in Tampa, Fla., for "his outstanding original research in the field of vampire bat rabies."

KEBLE PERINE,† agent of the Belmont (Mass.) Health Department, has joined the health team headed by FRED MAYES, M.D.,* in Pakistan, where he is stationed in Quetta, Baluchistan, as a sanitarian in the village aid program being set up in the various provinces.

OLIVIA PETERSON, retired national director of home nursing for the American Red Cross, is serving temporarily as public health nurse in Pope County, Minn., while FRANCES BACCHUS is doing graduate work at the University of Minnesota.

JOHN J. PRENDERGAST, M.D.,* medical director of Chrysler Corporation since 1936, has retired. He will make his home on his farm near Dryden, Mich.

THEODORE ROSENTHAL, M.D.,† has been named acting assistant commissioner of the City of New York Department of Health, succeeding RALPH S. MUCKENFUSS, M.D.,* now scientific director of the Naval Biological Laboratory, University of California, Oakland. In turn, ANTHONY A. BIANCO, M.D., has been named acting director of the department's Bureau of Adult Hygiene, which has been headed by Dr. Rosenthal.

KATHERINE C. ROSE,† hearing and vision test consultant, New Mexico Department of Public Health, has become Mrs. Charles H. Wood and is now a volunteer in testing, health education, and allied public health activities in Santa Fe.

PEYTON ROUS, M.D., who proved more than 40 years ago that a virus could cause a cancer, on April 5 in Houston received the Bertner Foundation Award, consisting of a bronze medallion, at the Eighth Annual Symposium on Fundamental Cancer Research conducted by the University of Texas M. D. Anderson Hospital and the Tumor Institute.

NINA RUBINO, abroad for some years with the Philco Radio Corporation, has succeeded CLAIRE DESOUSA as nutritionist, Cambridge (Mass.) Health Department.

JAMES PATRICK SHEEHY,† officer of the Public Health Service, has joined the U. S. Operations Mission in Iran.

JUSTUS J. SCHIFFERES, Ph.D.,† director of the Health Education Council, has been named science writer, National Foundation for Infantile Paralysis, New York City.

FRANK STONE, a recent graduate of Ohio State University, is now health educator, Hocking County (Ohio) Health Department.

MARY SWITZER, director, Office of Vocational Rehabilitation, in recognition of her work with the handicapped during 32 years in government service, received the annual award of the American Pharmaceutical Manufacturers' Association, at its recent 47th annual meeting.

HAMPTON H. TRAYNOR, M.D., M.P.H.,† former Whitman County health officer, is now health officer, Spokane, Wash.

DAVID R. WALLACE, D.D.S.,† district dentist for the Pennsylvania State Department of Health, has been named director of dental health, Virginia State Department of Health, Richmond, succeeding WILLIAM RUMBEL, D.D.S., deceased.

THOMAS H. WELLER, M.D.,† associate professor of tropical public health, Harvard School of Public Health, has been named the school's first Richard Pearson Strong Professor of Tropical Public Health, which is also the first endowed professorial chair at the school.

JEANNETTE E. WESTLAKE,† a nursing specialist, Health, Education and Welfare Department, has joined the U. S. Operations Mission in Iraq as a public health nurse supervisor.

EDWARD WRIGHT,* sanitary engineer in charge of the Sewage Disposal Section, Division of Sanitary Engineering, Massachusetts Department of Public Health, has retired after 47 years of service. He was recently tendered a testimonial dinner by his colleagues in the department.

NOVA YOUNG, former public health nurse consultant for the State Board of Health, has been appointed nurse consultant for the Medical Department of the Oregon Civil Defense Agency.

DEATHS

JOSEPH C. ANDERSON, M.D.,† district medical director, Ebensburg (Pa.) Department of Health (Health Officers Section).

AILEEN H. TUTTLE BELL, M.P.H.,† of Hammond, Ind. (Public Health Education Section).

RICHARD BRANDLON,† associate director, North Shore Clinical Laboratory, Chicago, Ill. (Laboratory Section).

ROBERT P. ELLERBUSCH,† sanitation engineer, Public Housing Administration, Ann Arbor, Mich. (Engineering Section).

JOSEPH S. GAVIN,† owner of the Gavin Dairy, Buffalo, N. Y., on September 15, 1953 (Food and Nutrition Section).

* Fellow.
† Member.

LEWIS S. HARRIS,† director, Belmont (Mass.) Department of Health and Education on March 4 (School Health Section).

GEORGE T. KENSLER, Ph.D.,† chief bacteriologist, Kraft Foods Company, Chicago, Ill., on September 30, 1953 (Food and Nutrition Section).

ROELOF LANTING, M.D.,† director, Lansing-Ingham Counties (Mich.) Health Department, on December 13, 1953 (Health Officers Section).

VINCENT J. MELE, JR., M.D.,† senior resident physician, New Jersey State Sanatorium for Tuberculosis, South Orange, N. J., on March 11 (Medical Care Section).

GEORGE H. SUMNER, M.D., M.P.H.,† health officer, Randolph County Health Department, Asheboro, N. C. (and not George H. Sumner of Nassau County (N.Y.) Department of Health, as erroneously listed in the May Journal) died December 13, 1953 (Health Officers Section).

CONFERENCES AND DATES

American Public Health Association. Headquarters: Memorial Auditorium, Buffalo, N. Y., October 11–15, and Related Organizations, including:

Administrators of Union Health Plans
American School Health Association
Business Management in Public Health, Association of
Commissioned Officers Association of the U. S. Public Health Service
Health Authorities of North America, Conference of State and Provincial
Health Council Work, Conference for
Hospital Planning Agencies, Association of
Maternal and Child Health and Crippled Children's Directors, Association of
Military Government-Civil Affairs Public Health Society
Municipal Public Health Engineers, Conference of
National Sanitation Foundation
Preventive Medicine, American Board of
Professors of Preventive Medicine, Conference of
Public Health Cancer Association
Public Health Education, Conference of Directors of
Public Health Laboratory Directors, Conference of State and Provincial
Public Health Laboratory Directors, Association of State and Territorial
Public Health Physicians, American Association of
Public Health Veterinarians, Conference of
Registration Executives, American Association of
Reserve Officers Association of the U. S. Public Health Service
Sanitary Engineers, U. S. Section, Inter-American Association of
Schools of Public Health, Association of

State and Regional Public Health Meetings:

Colorado Public Health Association. Hotel Stanley, Estes Park, Colo. June 10–11.
New England Health Institute. Burlington, Vt. August 25–27.
New York State Public Health Association. Lake Placid Club, Lake Placid. June 7–10.
Pennsylvania Public Health Association. Pennsylvania State University, State College, Pa. August 18.

Meetings of Other Organizations Coming in June, July, and August:

American Diabetes Association. San Francisco, Calif. June 19–20.
American Home Economics Association. San Francisco, Calif. July 6–9.
American Medical Association. Annual Meeting. San Francisco, Calif. June 21–25.
American National Red Cross. Los Angeles, Calif. June 14–16.
American Physical Therapy Association. Los Angeles, Calif. June 27–July 2.
American Veterinary Medical Association. Seattle, Wash. August 23–26.
Amherst Health Conference. University of Massachusetts, Amherst. June 15–18.
Association of Maternal and Child Health and Crippled Children's Directors. Glacier Park, Mont.. June 30–July 3.
Canadian Conference of Social Work. Toronto. June 24–26.
Canadian Institute of Sanitary Inspectors. Hotel La Salle, Kingston, Ontario. June 17–19.
International Cancer Congress (VI). Sao Paulo, Brazil. July 23–29.
International Congress on Mental Health (Fifth) and International Institute on Child Psychiatry. Toronto, Canada. August 14–21.
International Institute on Child Psychiatry. Toronto, Canada. August 13–14.
International Gerontological Conference (Third). London, England. July 19–23.
National Association of Sanitarians. 18th Annual Educational Conference. New Orleans, La. August 17–19.

* Fellow.
† Member.

National Council of Catholic Nurses. Mayflower Hotel, Washington, D. C. June 3–6.
National Council on Family Relations. Mills College, Oakland, Calif. July 8–10.
National Education Association. New York, N. Y. June 27–July 2.
National Medical Association. Washington, D. C. August 9–13.
World Assembly for the Welfare of the Blind. Paris, France. August 5–14.
World Child Welfare Congress. Zagreb, Yugoslavia. August 30–September 4.
World Federation of Occupational Therapists, First International Congress. Edinburgh, Scotland, August 16–21.
World Assembly of Youth. Singapore. August 16–27.
World Population Conference (United Nations). Rome, Italy. August 31–September 10.

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Holland-Rantos Company, Inc., New York, N. Y.
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Merck & Company, Inc., Rahway, N. J.
M & R Laboratories, Columbus, Ohio
Metropolitan Life Insurance Company, New York, N. Y.
Montefiore Hospital Medical Group, New York, N. Y.
National Dairy Products Corporation, New York, N. Y.
National Farmers Union, Denver, Colo.
New York Hotel Trades Council and Hotel Association Health Center, Inc., New York, N. Y.
Orkin Institute of Industrial Sanitation, Atlanta, Ga.
Oval Wood Dish Corp., Tupper Lake, N. Y.
Owens-Illinois Glass Company, Toledo, Ohio
Prudential Insurance Company of America, Newark, N. J.
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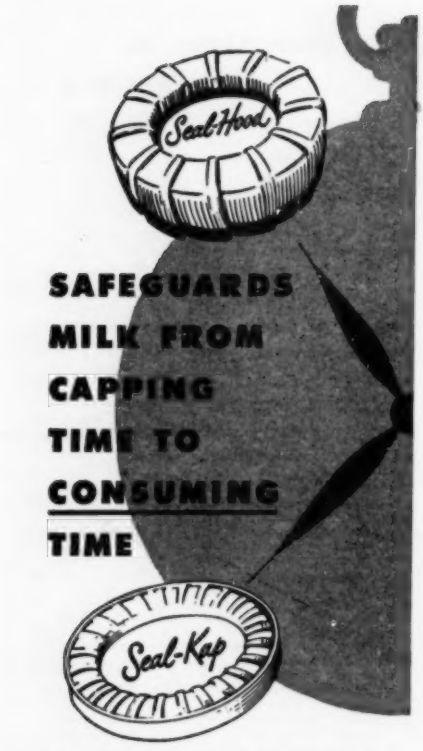

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A DETERGENT COMPOUND, TO BE OF VALUE, MUST HAVE CLEANING POWER

In a preceding number of this Journal we listed twelve desirable characteristics of detergent compounds. The first was CLEANING POWER.

It is rather obvious that the prime essential of a detergent compound should be the ability in solution to remove soil and to do this completely in the time interval available for the cleaning operation. What other sound reason could be offered for buying and using detergent compounds? But detergent compounds—even those prepared for similar applications—vary widely in cleaning power.

Are such differences, if any, in cleaning power of significance and concern to sanitarians? Yes, since *the cost of sanitation* is becoming a factor of increasing importance in the maintenance of the level of sanitation to which health departments aspire.

How may the cleaning power of a detergent compound be determined? Various laboratory methods have been devised, all of which necessitate the use of specially-devised or technical equipment, and are unsuitable for use by sanitarians in the field. However, a fairly reliable rule-of-thumb cleaning power assay measure is the concentration of solution necessary to produce satisfactory results. It may safely be assumed that a product which effectively removes soil with a solution concentration of one-third ounce per gallon of water has greater cleaning power than another compound which must be used at a concentration of one-half ounce per gallon to achieve a parallel result. It may be stated as a rule that relative cleaning powers of detergent compounds are inversely proportional to the lowest concentrations at which they effectively remove equal accumulations of soil.

Of course, detergent compounds should be assayed, with respect to relative cleaning powers, only against soils and under conditions for which they were formulated. It would be unreasonable to test a baby soap against the soilage on an auto mechanic's hands. Similarly, a general cleaner (to be applied manually) and a soaker bottle washing compound (applied mechanically) are not comparable.

A comparison of the concentrations at which detergent solutions *have to be* prepared for satisfactory results, frequently provides sanitarians with a clue to the cause of lapses in sanitation which are usually termed "unaccountable."

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Meats-in-a-Can

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Comparative Nutritive Values

From a practical dietary standpoint, meats-in-a-can—preserved by commercial canning—are nutritionally interchangeable with meats of like variety prepared in the home.[1] For taste appeal, for economy and "keeping" quality, and for household convenience, meats-in-a-can are advantageous in many respects.

As the comparative data here shown indicate, kitchen-prepared meats and similar meats-in-a-can are closely alike in the amounts of various nutrients they provide.

COMPARATIVE COMPOSITION OF KITCHEN-COOKED AND COMMERCIAL-CANNED MEATS
(Nutrient Amounts per 100 Grams)

	*Kitchen-Cooked Ham[2]	**Canned Ham[2] (Chopped, Cured)	Kitchen-Cooked Beef Round[2]	Canned Roast Beef[2]
Water	50%	50%	59%	60%
Protein	21 Gm.	20 Gm.	27 Gm.	25 Gm.
Fat (ether extract)	28 Gm.	20 Gm.	13 Gm.	13 Gm.
Niacin	4.6 mg.	4.3 mg.	5.5 mg.	4.2 mg.
Riboflavin	0.21 mg.	0.19 mg.	0.22 mg.	0.23 mg.
Thiamine	0.46 mg.	0.40 mg.	0.08 mg.	0.02 mg.

*Values after conversion from 42% to 50% water basis.
**Values after conversion from 58.69% to 50% water basis.

Experimental studies have shown that the processing which meats-in-a-can undergo leads to little if any greater vitamin losses than does home-cooking of similar cuts of meat. In general, meats-in-a-can retain of their original vitamin content approximately:

- **60 to 80 per cent of thiamine**
- **90 to 100 per cent of riboflavin**
- **90 to 100 per cent of niacin**
- **80 per cent of biotin**
- **70 to 80 per cent of pantothenic acid.[3,4]**

During storage for customary periods, at usual warehouse temperatures, meats-in-a-can show little, if any, further vitamin loss except in thiamine. Even thiamine, a highly thermolabile vitamin, was 52 per cent retained in pork-in-a-can after ten months' storage at 80° F. Retention of the vitamin was notably greater when the canned pork was stored at 38° F.

Since meats-in-a-can are thoroughly cooked in processing, they may be consumed as purchased, merely warmed or mildly cooked. When the meat is moderately cooked in preparation for consumption, little or no further loss in vitamins need to occur.

Recent studies show that meats-in-a-can are excellent sources of needed amino acids.[5] The 18 amino acids determined in these studies appeared in similar ratio and amounts in canned beef, pork, and lamb as in the respective fresh or home-cooked meats.

1. Howe, P. R.: Foods of Animal Origin, Handbook of Nutrition, American Medical Association, ed. 2. Philadelphia, The Blakiston Company, 1951, p. 637.
2. Watt, B. K., and Merrill, A. L.: Agricultural Handbook No. 8, United States Department of Agriculture, 1950.
3. Schweigert, B. S.; Bennett, B. A.; Marquette, M.; Scheid, H. E., and McBride, B. H.: Food Res. 17:56 (Jan.) 1952.
4. Rice, E. E., and Robinson, H. E.: Am. J. Pub. Health 34:347 (June) 1944.
5. Schweigert, B. S.: Am. Meat Inst. Foundation, Circular No. 8, Nov. 1952.
6. Schweigert, B. S.; Bennett, B. A.; McBride, B. H., and Gothneck, B. T.: J. Am. Dietet. A. 28:23 (Jan.) 1952.

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